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ABSTRACT

Secondary school driver education courses should provide the student with cognitive and affective learning experiences as well as psychomotor skills. Developed through the cooperation of an advisory committee, workshop group, and other consultants, this curriculum guide is intended to help teachers, supervisors, program administrators and teacher educators do just that. Included in the guide are sections on the need for driver and traffic safety education, curriculum rationale, teaching-learning interaction, and a 107-item bibliography. The curriculum contains objectives, content and learning activities divided into these major sections: (1) Introduction, giving an overall picture of the highway transportation system, (2) On Highway Tasks, (3) Readiness Tasks, and (4) Improvement Tasks. Human functions--identify, predict, decide, and execute--involved in performing traffic-related tasks serve as reference points throughout. Behavioral objectives emphasize student-environment interaction. Fundamental concepts are repeatedly stressed, but the material attempts to lead the student through an enquiry process which results in the student discovering these concepts for himself. (CD)

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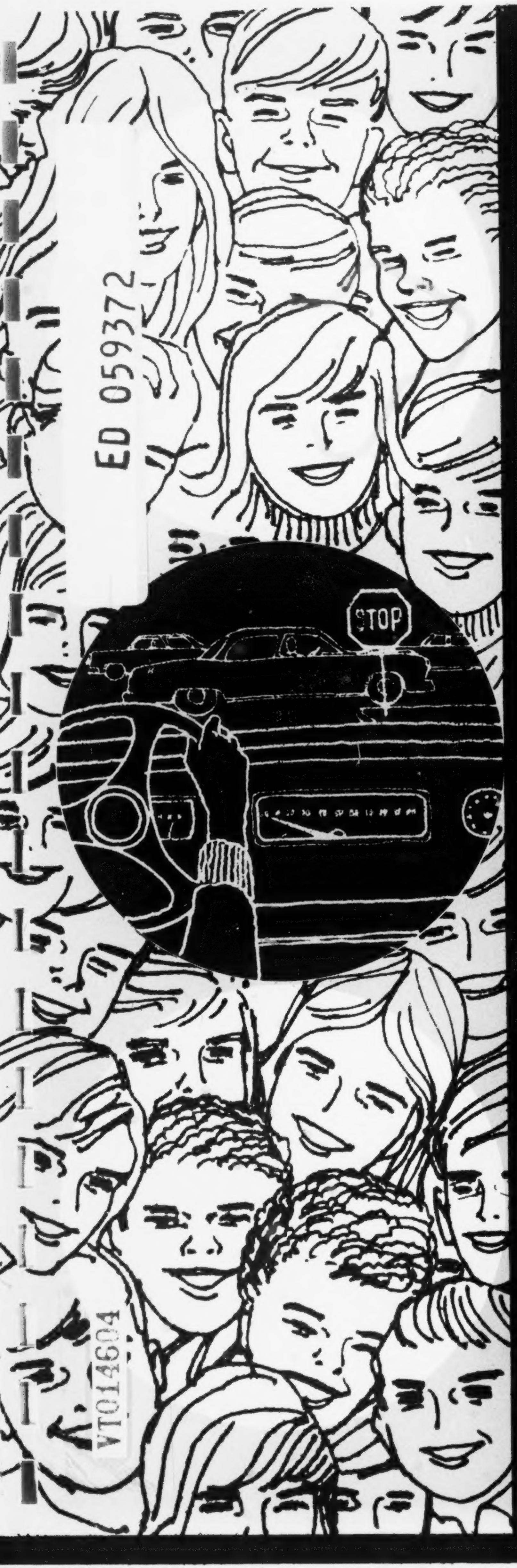

A RESOURCE CURRICULUM IN

DRIVER and TRAFFIC SAFETY EDUCATION

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FOREWORD

The Automotive Safety Foundation has long sought to further highway safety and transportation development. Work and support in behalf of improved driver and traffic safety education has been a part of the ASF highway safety effort from the early years of the Foundation's history.

An analysis of needs and priorities in driver and traffic safety education led educators of the Automotive Safety Foundation to identify the curriculum area as one especially productive avenue for study and development. This document resulted from that effort. It represents another step in the journey toward improved driver preparation and performance.

The significance and value of this effort will be gauged in terms of its influence on educational thought and practice. Curriculum planners, program supervisors, teacher educators and classroom teachers are in a position to influence new directions in driver and traffic safety education. We hope this publication will aid them in doing so. The ultimate test is the extent to which this resource curriculum enables learners to develop, sustain and demonstrate a commitment to proficient personal driving and responsible civic action for highway safety.

D. Grant Mickle
President
Automotive Safety Foundation

PREFACE

In November, 1966, the Trustees of the Automotive Safety Foundation met in their Annual Meeting to consider the Foundation's proposed 1967 Budget. Among the grants approved for funding was the ASF Driver Education Curriculum Study and Development Project. With this action, work was begun on the project which has resulted in the publication of this document.

The project arose from a recognition that preparation to drive–through effective education and training programs–is basic to safe motor vehicle operation. And, that safe and efficient movement of persons and goods over the nation's highway transportation system is fundamental to social and economic progress in the United States. Highway collisions and congestion needlessly and tragically retard this progress through deaths, injuries and economic losses among highway users. Driver and traffic safety education, along with other countermeasures such as enforcement and engineering, must be thoughtfully planned and vigorously applied to reverse the trend of these human and material losses.

In the last decade, curriculum study and reform in education has been the rule rather than the exception. Biological science, mathematics and physics were among the first areas to undergo study. More recently, the language arts and the social sciences have joined in this search for greater meaning and understanding.

But systematic extended curriculum study and reform *in driver and traffic safety education* is atypical. Heretofore, most driver education curriculum development work has been piecemeal and hurried. Those with experience in curriculum guide preparation in local schools and state education departments know the problems well. A series of "after school hours" committee meetings or a brief workshop session is typical. Time pressures usually result more in a tinkering action with existing curricular outlines than in a fresh open-ended approach to the assignment. It's simply a lot more practical under such circumstances to *rearrange* rather than redesign. There have been fortunate exceptions to this general pattern, but all too seldom.

The ASF Project was designed to overcome typical operational problems. By planning work over a several year period and engaging the services of a recognized authority, there was a better opportunity for thoughtful, systematic study, reflection and re-evaluation.

The Foundation was indeed fortunate to have Dr. Richard W. Bishop of Florida State University serve as Study Director. During the study period, Dr. Bishop sometimes served ASF on a full-time basis while on leave from the University; at other times, he met his full-time faculty responsibilities while also guiding and directing the project work. In all instances, he brought to this work valuable technical competence and experience, productive organizational talent, insightful writing and a rare sense of good humor. We are indebted to him for his leadership and signal contributions to the project.

It has been this writer's pleasure to have been both associated with and responsible for the administration of this project from its inception. The idea for the project originated with ASF staff, and several of the Foundation members have provided professional assistance in the development of this document over the past three years. But the greater share of inputs to this work–both qualitative and quantitative–came from the Project Director and the many teachers and other professionals who assisted him. We have attempted to acknowledge this assistance elsewhere in this publication, but our appreciation cannot adequately be expressed herein.

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Building on the initial project proposal prepared by ASF staff, in early 1967 Dr. Bishop prepared a more detailed Study Prospectus which fixed the project's purpose as, ". . . determining the cognitive, affective and psycho-motor learning involved in desirable driver performance . . . and developing a curriculum to produce such performance." Or, put more simply, the purpose might have been stated: first determine what actions make up the driving task (when well performed), and then design an instructional program that will result in such actions being learned and used.

An Advisory Committee of curriculum specialists, driver educators and researchers, convened in May, 1967, to examine and evaluate the Study Prospectus. Many of their valuable suggestions were incorporated into the plan and work thereafter was in accord with this revised Study Prospectus. As work progressed other inputs came from driver educators and others, including specialists in related highway safety areas such as traffic engineering, police traffic services, etc.

Basic to the project's purpose was the concern that driver and traffic safety education seek and evolve a plan for excellence. Overall, this involves a search for: more relevant content; improved organization and administration; effective teacher performance; judicious evaluation; cogent internal communications with educators and external communications with others. Much of this relates to the curriculum itself–what is to be taught, and how best to teach it.

Ideally, of course, a research based model of the driving task would have been used as a reference point and curricula developed to support this model. Unfortunately in 1966 there was no such model available nor is one available today. It is encouraging to note that the National Highway Safety Bureau has begun to sponsor research of this nature as this document goes to press.

In this project, every attempt was made to identify and use known elements of the driving task (as performed by safe, efficient motor vehicle operators) as a basis for curricular content. Content selected in this way has its roots both in research findings and carefully conceived rationales. Some decisions by Project Staff were difficult and subjective owing to conflicting or insufficient research evidence. *But such will always be the case and students now in classes cannot realistically be told to "wait until all the answers are known."*

For the most complete understanding and effective use of this publication, the reader is urged to examine it in its entirety. While Part III would typically be regarded as "the curriculum content section," it is important to understand the rationale behind its organization; this is explained in Part II. Ideas discussed in the Teaching and Learning portion (Part IV) are fundamental to the teaching-learning equation and should receive careful study and consideration.

Quite naturally perhaps, those of us who have been closely associated with the development of this *Resource Curriculum* are pleased to see it reach the terminal point of publication and distribution. We witness this moment, however, with several hopes and expectations, namely that: (1) this document be regarded as the *beginning* of a project effort rather than its conclusion; (2) teachers, supervisors, program administrators, teacher educators and others will seek to carefully and critically examine its content and philosophy, as well as experiment with its use both as a resource for curriculum change and in actual instruction.

For our part at the Foundation, we intend to continue an active interest in instructional improvement through curriculum design and implementation. Within the limitations of budget and staff time, we are particularly interested in making staff available as needed to direct or assist in State and local curriculum committee work and in preparing teachers to utilize this resource curriculum. We also hope to explore new avenues for implementation of some aspects of the curriculum. Finally, we are most anxious to evaluate the effectiveness of the curriculum.

Initial plans and a modest beginning is already being made along these lines as this document goes to press. We will be pleased to join hands with others who have a similar commitment to the improvement of driver and traffic safety education.

From the outset, this project has proceeded with the intent that it result in a contribution to improved highway safety. To further this goal, the *Resource Curriculum* is available to all; there is no copyright on its contents. Acknowledgement of source will be appreciated.

History reveals that sound curricular development more often proceeds through slow, steady growth than by major leaps and bounds. Potentially significant steps are possible, and it is hoped this ASF project is one such step, but the expectation is that other systematic study will follow over the years. In this way a continuous, successful search for improvement may result.

Charles H. Hartman
Director
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Warren P. Quensel of Illinois State University served as Assistant to the Study Director during the early stages of the project; Arthur A. Opfer, a Foundation staff member, served in this capacity during the latter half of the project duration.

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National Education Association
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Members of a Workshop group who, in the early stages of the project: (1) developed a curriculum structure; (2) pooled ideas on objectives, content and methods; and (3) experimented with various approaches to curricular development. This group also served in a continuing capacity in reviewing curriculum materials and experimenting with certain segments of the emerging *Resource Curriculum.*

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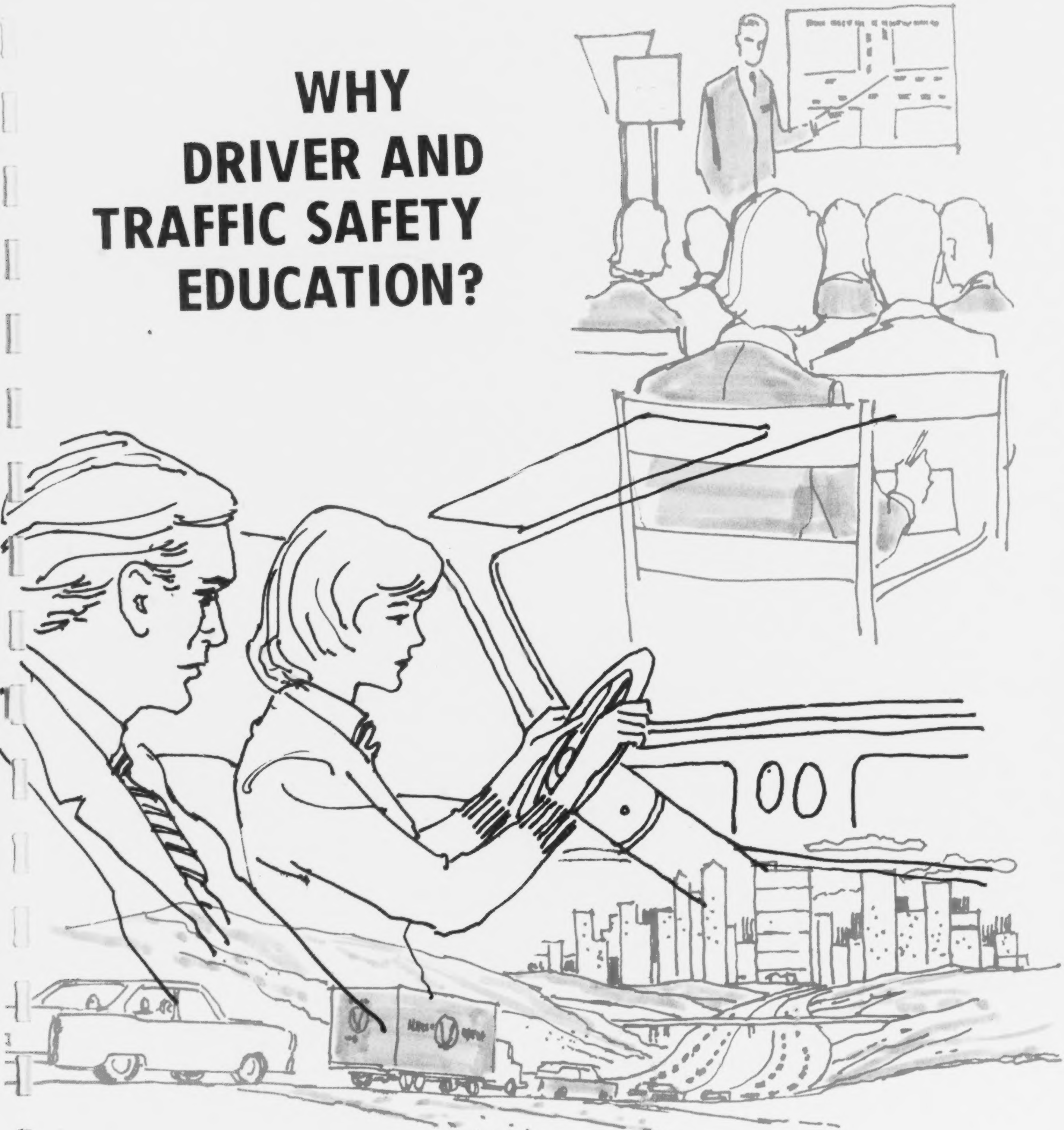
PART I

WHY DRIVER AND TRAFFIC SAFETY EDUCATION?



WHY DRIVER AND TRAFFIC SAFETY EDUCATION?

The growth and development of a nation depends largely upon the capability of its transportation system to move persons and goods to desired locations safely, rapidly and efficiently. Highway transportation, a sub-system of the complete transportation system, is a huge, loosely coordinated complex consisting of more than 100 million vehicles and operators, traveling in excess of 1,000 million miles a year on 3.5 million miles of roadway. It is becoming increasingly important that the highway transportation subsystem (hereafter referred to as *the* system) be coordinated with air, water and rail transportation sub-systems.

The development and management of highway transportation involves millions of people in a gigantic task of business, manufacturing and public administration. This task entails producing vehicles; building roads and parking facilities; providing supplies and services which vehicle owners require; developing regulations, facilities and devices; planning and operating traffic control devices; informing, educating and controlling drivers; and many other activities. Primary management forces are engineering (highway, traffic and vehicle), motor vehicle administration, police traffic supervision, traffic courts, medical care and transportation of the injured, and education (Fig. 1). Since the Department of Transportation was established, the federal government has played a major role in setting management standards and providing financial support to achieve greater uniformity and effectiveness.

Man plays varied and active roles in the highway transportation system. Millions of people are engaged in occupations directly related to developing and managing highway transportation. Nearly two-thirds of the entire population are involved as eligible voters and taxpayers, influential in determining public policy and in financing the system. Of these, more than 100 million – nearly half of the population–are licensed operators, forming a major component in the man-machine-roadway system as they interact with each other, and as they relate to management functions. In short, the highway transportation system touches everyone.

Man needs formal preparation to perform the varied traffic-related tasks, of which driving is the most prominent. Operating a motor vehicle is a complex and important task that the average driver performs 300 hours per year, which amounts to 375 weeks of driving and an expenditure of $50,000 in a life time (2). It can be argued that driving is the most important skill in contemporary society, insofar as the threat to human life is concerned. In any case, it is too important to learn by chance or in a haphazard way. Elementary and secondary schools can and should contribute their resources to introducing young people to the highway transportation system, and preparing them for an increasingly active role, not only as a driver, but also as an informed and active supporter of sound traffic safety programs.

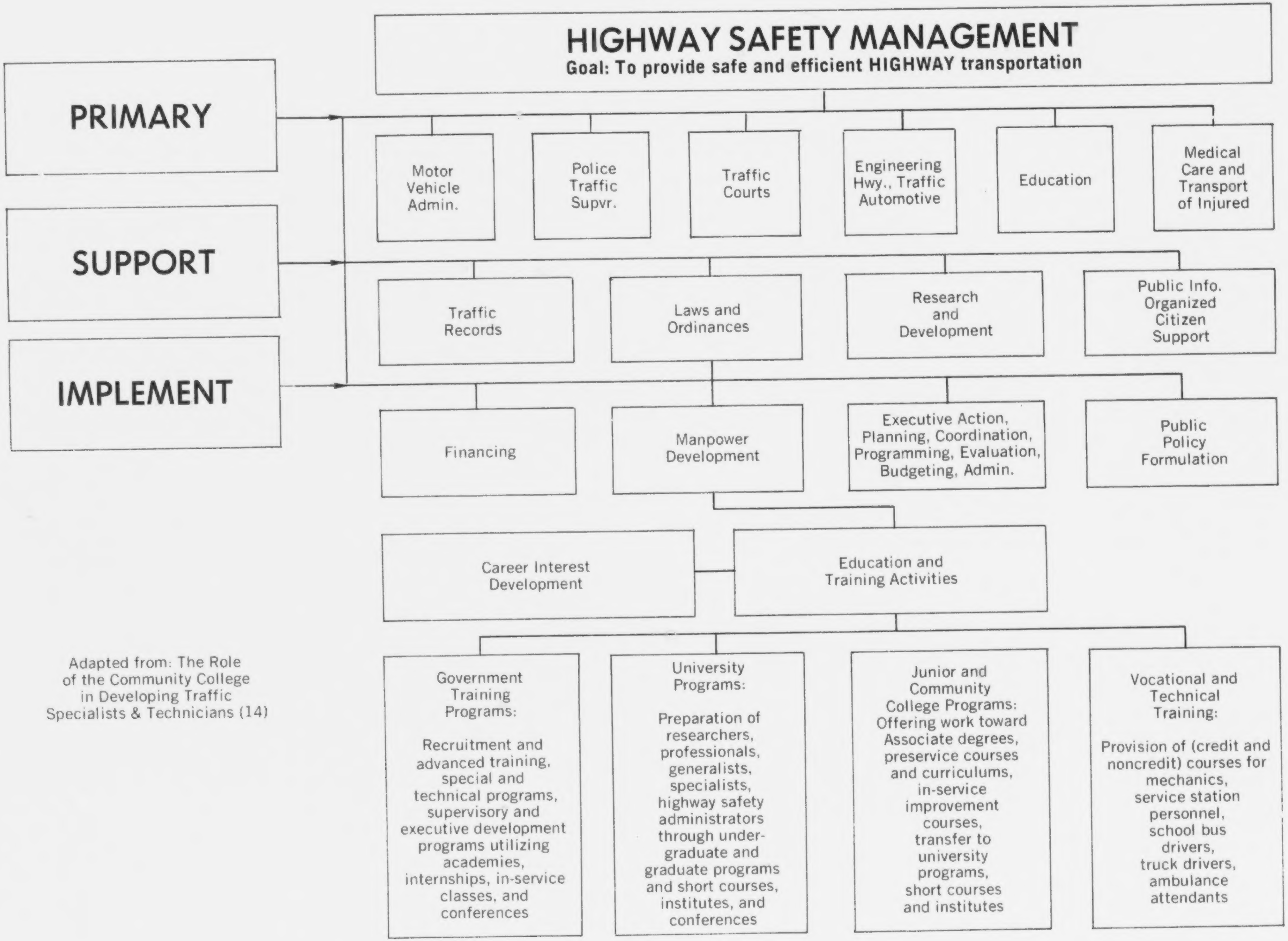
Education for traffic safety should have its foundation in the elementary schools. Children of elementary school age are not driving motor vehicles, but they are active participants in the system as pedestrians, passengers and operators of bicycles. There is some indication that potential problem drivers can be identified among elementary school children, and this suggests that remedial efforts be planned to modify the characteristics that will predispose these children to accidents. Apart from this point, all elementary school youth will profit by well conceived instruction that helps them to acquire the concepts, skills and values needed as a sound basis for a lifetime of safe and efficient use of highway transportation facilities.

The secondary schools (focus of this study) are uniquely qualified to prepare young people for entrance into the traffic system as operators, and as responsible participants in programs which affect system performance. At this level of formal education, youth reaches legal driving age in an environment that includes resources for learning under professional teachers. Student interest in learning to drive can be exploited not only for creating good drivers, but also to put meaning into many concepts and values considered as general education. The primary aims of secondary school Driver and Traffic Safety Education are to:

1. prepare students with at least minimum performance capabilities for entry into the highway traffic system as vehicle operators;
2. equip students with knowledge and thought processes that will *enable* them to make wise decisions in situations that could lead to impaired driving performance (alcohol, drugs, fatigue, emotions and vehicle maintenance); and
3. help students acquire the insights and motivations needed to *become* fully functioning operators and responsible members of the system.

The third objective implies continuing development of traffic related competencies throughout a driver's career, made possible by learning experiences in Driver and Traffic Safety Education. Driver Education experiences should help students to acquire a clear and full picture of driving performance variables, as a profile for assessing and improving their own and system performance.

Figure 1


HIGHWAY SAFETY MANAGEMENT
Goal: To provide safe and efficient HIGHWAY transportation
PRIMARY
SUPPORT
IMPLEMENT
Motor Vehicle Admin.
Police Traffic Supvr.
Traffic Courts
Engineering Hwy., Traffic Automotive
Education
Medical Care and Transport of Injured
Traffic Records
Laws and Ordinances
Research and Development
Public Info. Organized Citizen Support
Financing
Manpower Development
Executive Action, Planning, Coordination, Programming, Evaluation, Budgeting, Admin.
Public Policy Formulation
Career Interest Development
Education and Training Activities
Government Training Programs:
Recruitment and advanced training, special and technical programs, supervisory and executive development programs utilizing academies, internships, in-service classes, and conferences
University Programs:
Preparation of researchers, professionals, generalists, specialists, highway safety administrators through under-graduate and graduate programs and short courses, institutes, and conferences
Junior and Community College Programs: Offering work toward Associate degrees, preservice courses and curriculums, in-service improvement courses, transfer to university programs, short courses and institutes
Vocational and Technical Training:
Provision of (credit and noncredit) courses for mechanics, service station personnel, school bus drivers, truck drivers, ambulance attendants

Adapted from: The Role of the Community College in Developing Traffic Specialists & Technicians (14)

Curriculum construction in driver and traffic safety education should be tied in with over-all curriculum planning. Many of the crucial issues in traffic safety are not isolated issues, but instead are related to the broad areas of human behavior. For example, the drinking and driving problem is simply part of the alcohol problem in general. The same can be said about drug use, emotions, the aging process, law and order, and other social problems. These concerns are identified in the traffic environment by poor performance and accidents. This reality suggests that the driver and traffic safety education teacher should work with other teachers, and with outside agencies, to develop and implement a coordinated instructional plan that integrates and reinforces traffic related concepts and values throughout the curriculum.

Teaching related to the highway transportation system can best be carried forward in a separate course, for it concerns learning that embraces the cognitive (knowledge and intellectual skills), affective (attitudes, values and emotional sets) and psycho-motor (neuromuscular coordination). Conceivably, many traffic related concepts could be, and in some cases are, integrated in physics (physical laws), health education (alcohol and drug use), vocational education (vehicle maintenance), business education (vehicle insurance), social studies (social and economic affects), and in other subjects. This practice should be encouraged. However, not every student takes all of these courses, so they would be only partly "educated." In the absence of a separate course, even perfect integration would fail to cover a substantial body of content which deals with the act of driving (e.g., basic control tasks, interacting with other highway users, handling complex and critical situations). To ask other subject areas to assume this burden would distract them from their primary objectives. Besides, teacher competency would be in question.

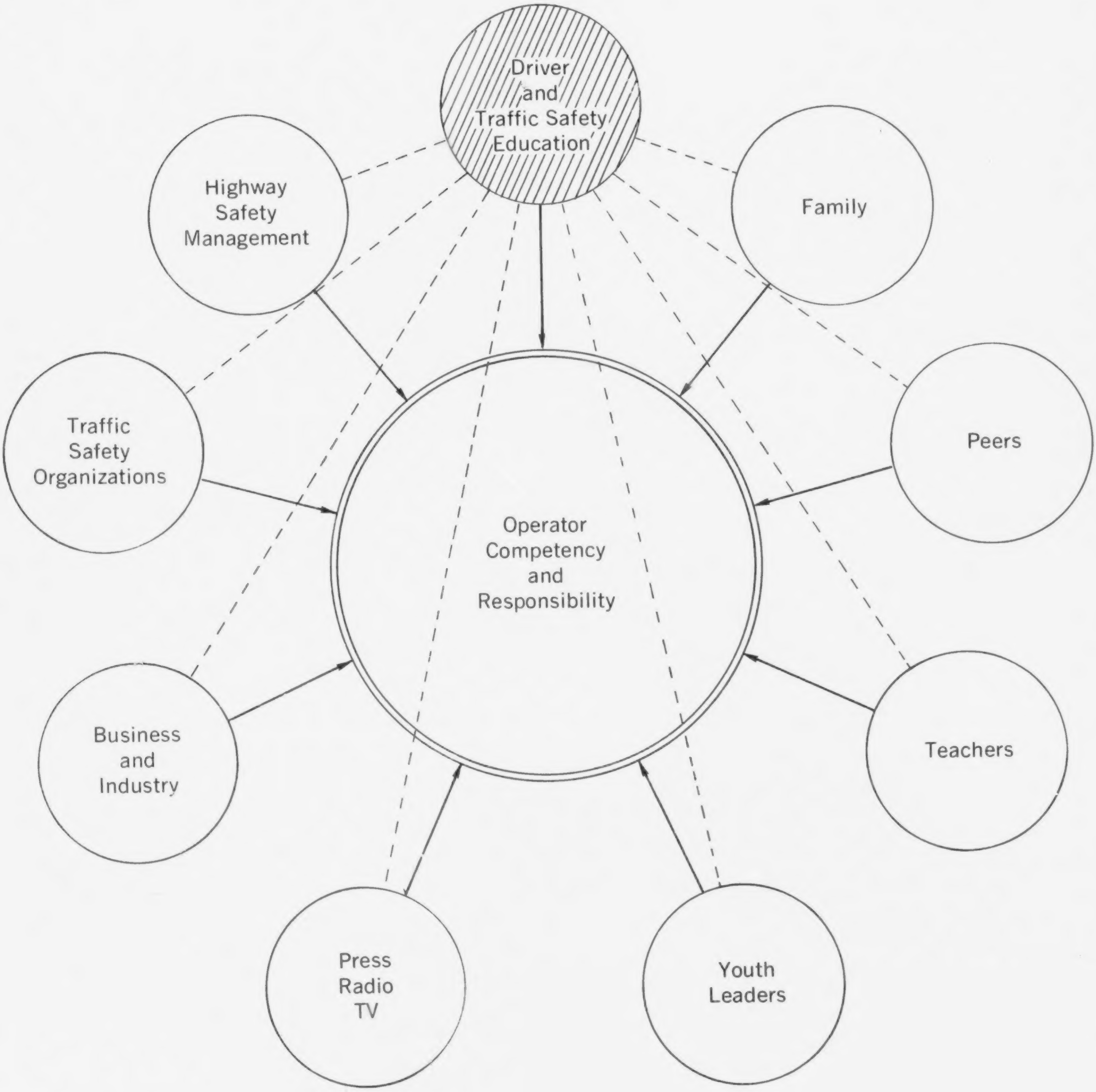
Multiple forces help to shape the behavior of highway users, even before the individual reaches driving age. Behavior when operating a motor vehicle mirrors the kind of person we represent. Granted, the frustrations and anonymity of the highway traffic environment can bring out the worst in us. Nevertheless, *our* overt acts reflect our personality and temperament. This reality helps us to see that any experience which helps to mold our beliefs and attitudes–particularly those related to self concept and concepts about other people–indirectly influences our behavior in relating to the highway traffic system. (Fig. 2).

Although driver and traffic safety education is only one force that influences operator behavior, it can have a most powerful influence. The course cannot be expected to change the student's "style of life," but it can change his "style of driving." Furthermore, a quality program can influence the other forces that determine operator behavior. Students in today's driver education classrooms will be the parents, traffic police, judges, engineers, motor vehicle administrators and private citizens of tomorrow. But, neither students nor teachers need to wait for the long-range payoffs. They can become involved in immediate system improvement measures.

In summary: Secondary school Driver and Traffic Safety Education, as one of the direct forces influencing operator behavior, can also exert beneficial influence, both immediate and long-range, on the highway transportation system. *The overarching goal of Driver and Traffic Safety Education is to improve the quality of human decisions and performance tasks related to the system in a manner that encourages continuing improvement.* To the degree that we are successful in attaining this goal, we increase the probability that operators will be able to drive from origin to destination safely, expeditiously, conveniently and economically, thereby serving both individual and system purposes.

FORCES SHAPING OPERATOR COMPETENCY AND RESPONSIBILITY

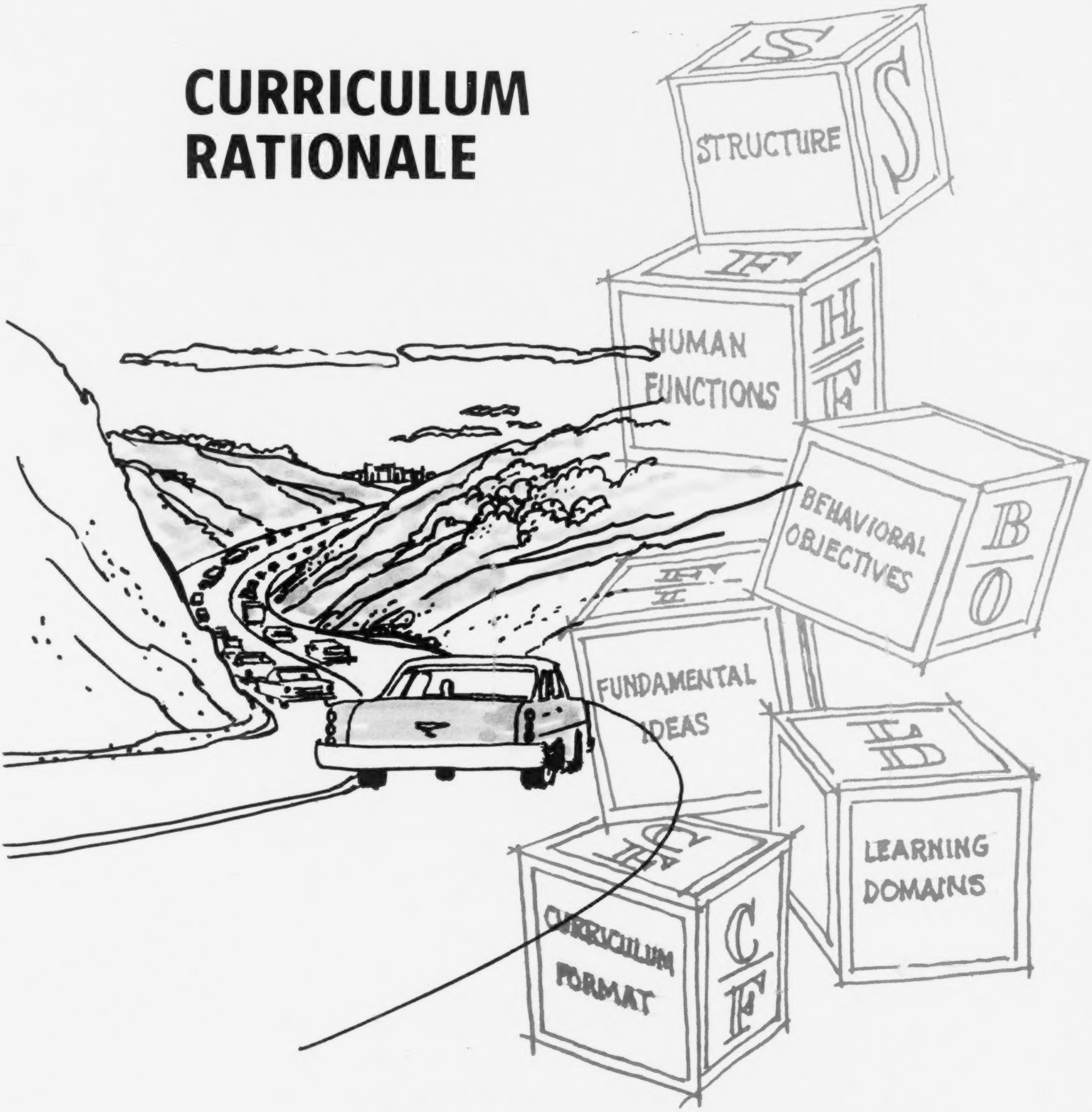
Figure 2


Driver and Traffic Safety Education
Highway Safety Management
Family
Traffic Safety Organizations
Peers
Operator Competency and Responsibility
Business and Industry
Teachers
Press Radio TV
Youth Leaders

(Driver and Traffic Safety Education Can Influence These Forces)

PART II

CURRICULUM RATIONALE


S
STRUCTURE
S
HF
HUMAN FUNCTIONS
HF
BEHAVIORAL OBJECTIVES
B
O
FI
FUNDAMENTAL IDEAS
LD
LEARNING DOMAINS
CF
CURRICULUM FORMAT
C
F

CURRICULUM RATIONALE

This part of the publication highlights the philosophy and assumptions underlying the process used in developing the Resource Curriculum. Following a look at the overall curriculum structure, key aspects pervading the curriculum presented in Part III are explained. They relate to (1) Human Functions, (2) Behavioral Objectives, (3) Fundamental Ideas, (4) Learning Domains and (5) Curriculum Format.

Structure

Tasks that individuals perform relative to driving and traffic safety serve as natural focal points around which to structure the curriculum. In this project, objectives and content items were derived from and grouped around what people do, on and off the highway, in relating to the system. This process served to reduce personal bias in selecting objectives and content. Behavioral objectives were included when they contribute to a decision or performance involved in one of the tasks. In some cases the judgments were difficult and somewhat subjective because of insufficient evidence about the task. However, curriculum developers cannot wait until all the evidence is in, because students need to be taught now.

The proposed curriculum is based on the following structure and accompanying rationale. (Fig. 3 presents the overall structure in chart form.)

Introduction–The Highway Transportation System

Before man attempts to function within a system he should have a clear picture of the (1) system components and controls, (2) criteria for judging the effectiveness of the system, and (3) membership responsibilities as an operator and non-operator.

Section I–On-Highway Tasks

As a vehicle operator,* man's role in the highway transportation system consists of the following sub tasks:

> Controlling the relationship of the vehicle (movement dynamics) to the roadway through proper selection of direction and speed alternatives (Unit A).
>
> Interacting effectively with other highway users in routine and difficult highway and traffic conditions (Unit B).
>
> Occasionally handling a critical situation triggered by loss of traction or vehicle failure (Unit C).
>
> Coping with a highway collision situation if directly involved or one of the first to come upon the scene (Unit D).

Section II–Readiness Tasks

Certain decisions and actions, before a trip begins and at temporary stops along the route, either increase or decrease the probability of successfully completing the mission. These tasks include:

> Assessing physical, mental and emotional fitness for the mission (Unit A).
>
> Making sure that the vehicle is appropriate and in good condition for the mission (Unit B).
>
> Choosing the best routes, times to travel, places to stop (for fuel, food and rest), and auxiliary equipment to cope with special problems (Unit C).

Section III–Improvement Tasks

The fully functioning member of the highway transportation system works toward system improvement by:

> Striving to become an expert driver through a self analysis and self improvement program (Unit A).
>
> Actively supporting programs designed to improve the quality and coordination of system components (Unit B).

In the preceding structure you do not find special units on rules of the road, physical laws and other traditional unit titles. These clusters of content bear importantly upon the performance of some tasks, and are certainly not neglected in this study. They are simply divided and placed with the tasks to which they relate. For example, laws that deal with intersections are included with the task of negotiating intersections. The "centrifugal effect" on a curve falls under the cornering task. The project staff felt that the areas of knowledge relevant to vehicle operation are made more meaningful to the student if they are presented in direct relationship to performance.

Human Functions–Basic Points of Contact and Connection for the Curriculum

Performance depends upon the efficiency and effectiveness of human functions applied to the task, so educational efforts should be directed toward developing the quality of these functions. Although researchers have classified these functions somewhat differently (1)(8)(86), their analyses appear to agree in substance. The terms in the study follow closely those proposed by Schlesinger (86). They are:

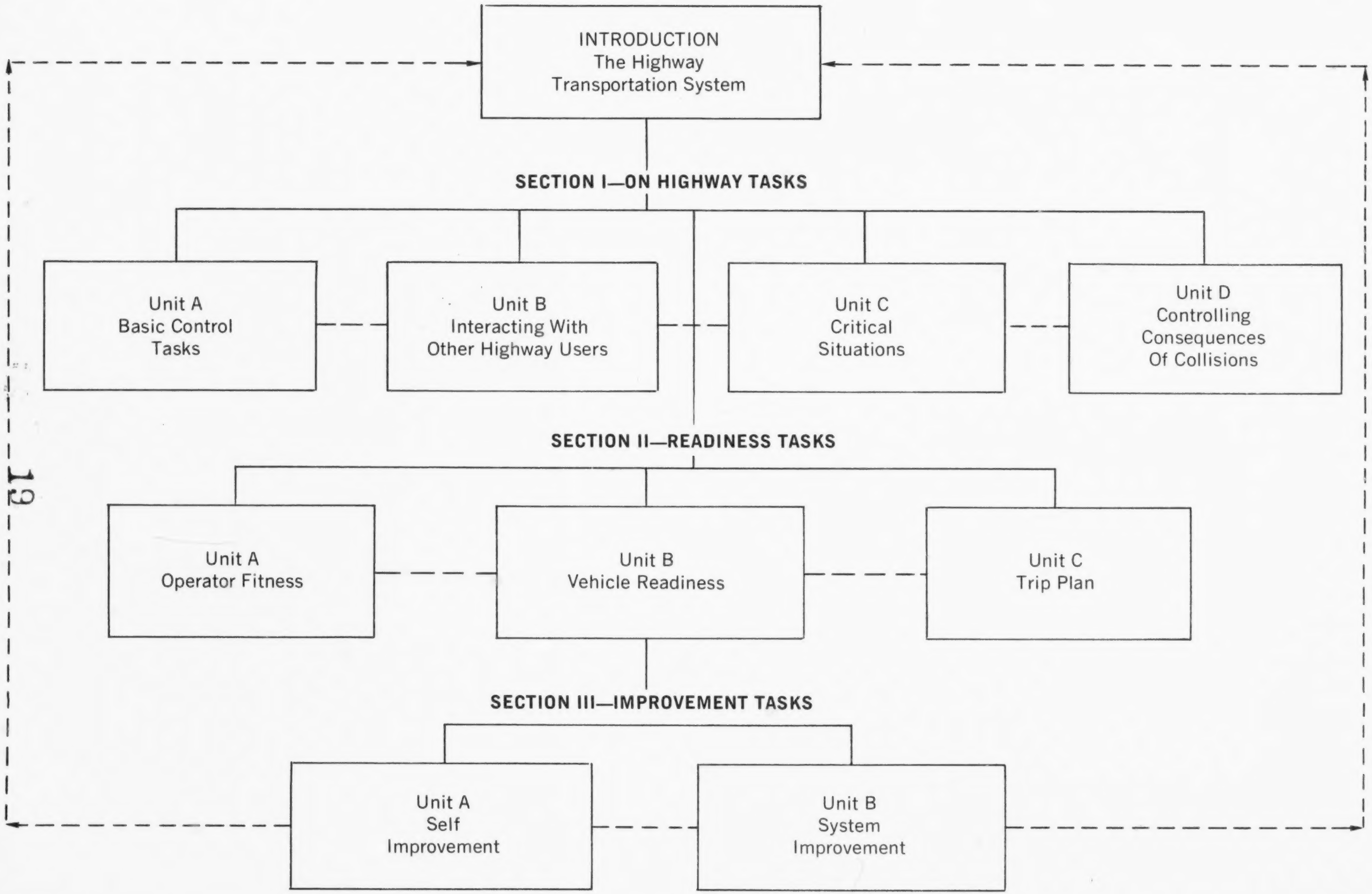
1. *identify* the relevant cues;
2. *predict* their significance;

---

*Throughout this publication, the term "vehicle operator" applies to both two and four-wheel vehicle operator, unless a distinction is made.

DRIVER AND TRAFFIC SAFETY EDUCATION CURRICULUM STRUCTURE

Figure 3


INTRODUCTION
The Highway
Transportation System
SECTION I—ON HIGHWAY TASKS
Unit A
Basic Control
Tasks
Unit B
Interacting With
Other Highway Users
Unit C
Critical
Situations
Unit D
Controlling
Consequences
Of Collisions
SECTION II—READINESS TASKS
Unit A
Operator Fitness
Unit B
Vehicle Readiness
Unit C
Trip Plan
SECTION III—IMPROVEMENT TASKS
Unit A
Self
Improvement
Unit B
System
Improvement

3. *decide* what to do; and
4. *execute* your decision.

The precise division and labels are not important so long as they come from a systematic and logical analysis, and are meaningful to the teacher and his students. Some may prefer to use "perception" instead of "identify"; and "judge," "evaluate," or "assess" instead of "predict." In any case the person senses and processes information, decides and acts. These functions tend to blend together and overlap in the rapidly changing traffic environment. None of them is independent; indeed, listing them separately is more a convenience than a reflection of reality. They are separated in this project to stress the mental as well as the physical functions of driving, and also to help identify techniques for developing the functions. (Fig. 4)

Each lesson, even those that deal with behavior off the highway, can be related to these functions. Alcohol, drugs, emotions and fatigue are considered in terms of how they affect the driver's ability to identify, predict, decide and execute. The functions also apply to units on self and system analysis and improvement. To improve you must first *identify* weaknesses, *predict* the consequences of proposed improvement choices, *decide* upon a course of action, and finally *execute* the plan. Since these functions have such wide and powerful applicability it is suggested that they serve as the *fundamental concepts for the curriculum.* (They are described in detail in Section I, Unit B, Episode 1.0.)

Behavioral Objectives

This project has been influenced by those who emphasize that objectives should be written in terms of measurable learner performance (45)(64). Behavioral or performance objectives include a verb denoting observable action such as identify, write, classify, predict, summarize or compare. These terms are less subject to misinterpretation than verbs like know, understand, appreciate and other vague terms, and thus tend to communicate more reliably. In the statement of objectives is a description of the stimulus being responded to, and an indication of the desired adequacy of the action. Here is one example:

> When given a series of critical situations (via film, slides or diagrams) where a quick response is needed to avoid or reduce the impact of a collision, students will be able to select the better course of action from the alternatives given for each situation.

One can readily see that these objectives are not descriptions of content or teacher performance, but instead represent in precise language what performance capabilities are expected of students as a result of the learning experience.

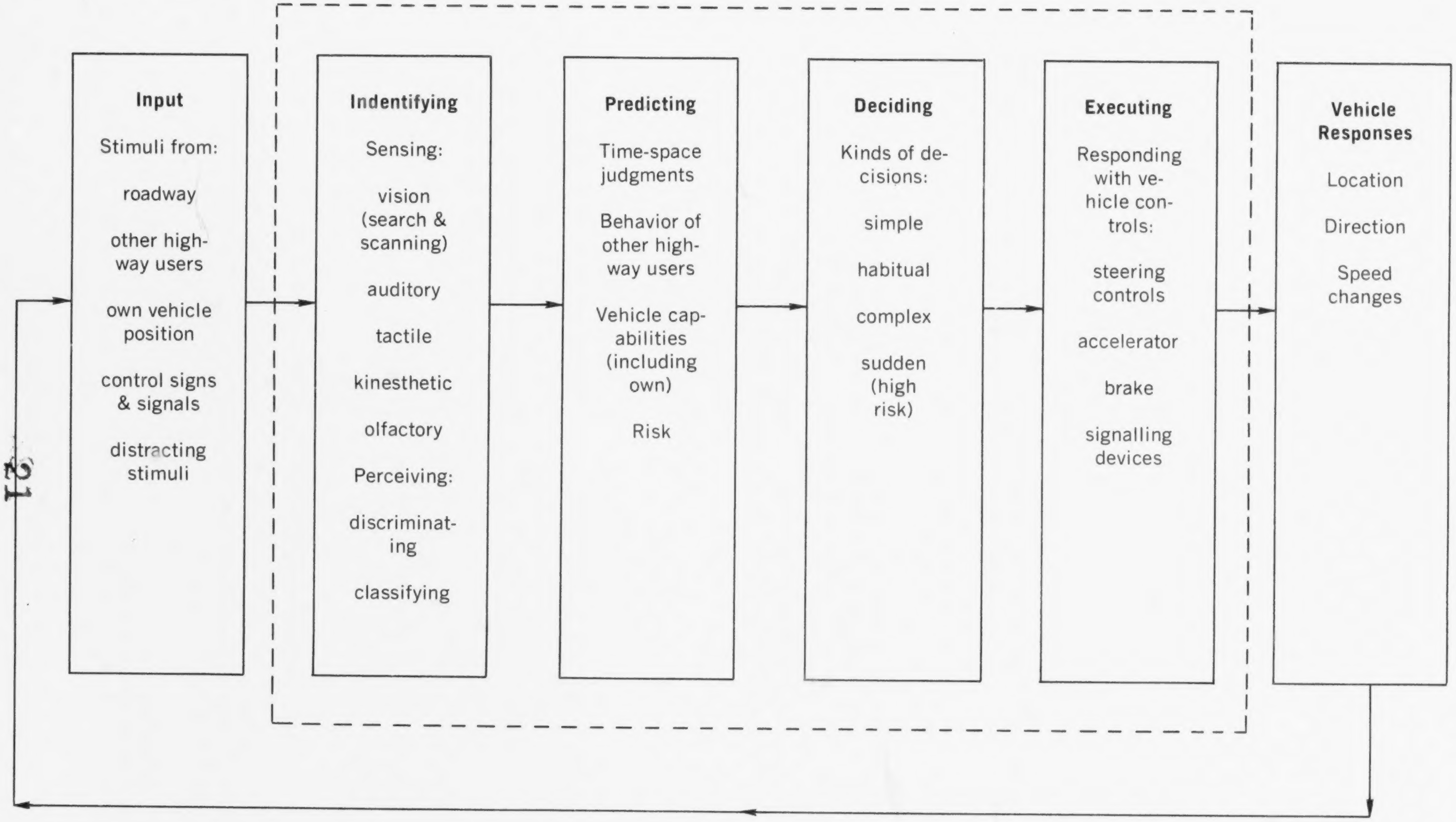
Although all of the objectives will be labeled "behavioral objectives," a close look will reveal that two distinct kinds of behavior are represented. On one hand the behavior is immediate and close to that required in real world performances. For example, in the laboratory phase of the course, we are able to teach and measure the degree to which students have learned to control the vehicle, interact with other highway users, and handle complex and a few critical situations. Another group of objectives represent only proxy measures of real world performance. These could be termed "behavior potentials" or "enabling objectives," because here students acquire knowledge, intellectual skills, and attitudes enabling them to handle real world situations, should they arise. To illustrate, testing of a student's ability to handle a skidding vehicle would be too hazardous with facilities available to most schools, but we can test his understanding of the factors involved in the prevention and correction of skids, hoping that this cognitive learning will make a difference in actual driving performance. Also included in this category of objectives are behavior potentials designed to prepare students to make intelligent choices in non-driving, traffic related situations. We cannot be certain how a student will respond one, three or five years later when he is faced with a situation involving drinking and driving, vehicle maintenance, trip planning, handling of an accident scene, or support for a traffic engineer. However, through problem solving, simulation and other methods, we can help students to acquire correct information and to develop a process for making rational decisions. How well students acquire these behavior potentials can be measured, and in that sense they are also immediate behavioral objectives. Therefore, no distinction is made in this resource.

At least three advantages appear to result from clearly stating objectives in terms of student performance. First, wise teachers know the motivational value of telling students what they will be able to do when a particular topic is completed. Secondly, measurable objectives enable teachers and researchers to design instruments by which instructional procedures can be evaluated. The third advantage relates to the "image" of driver and traffic safety education. Those who make curriculum decisions, support groups and the public-at-large, need and deserve to know what can and cannot be accomplished through a given subject. Expressing the content in measurable terms provides a base for demonstrating the learning outcomes to these various "publics." In sum, behavioral objectives are potentially valuable for (1) motivating the students, (2) helping teachers and researchers evaluate content and process as a means to curriculum improvement, and (3) creating a better understanding of the nature and scope of driver and traffic safety education.

A feeling prevails that not all of the learning goals in Driver and Traffic Safety Education can be observed and

MAN-MACHINE-ENVIRONMENT ANALYSIS
Human Functions

Figure 4


Input
Stimuli from:
roadway
other highway users
own vehicle position
control signs & signals
distracting stimuli
Indentifying
Sensing:
vision (search & scanning)
auditory
tactile
kinesthetic
olfactory
Perceiving:
discriminating
classifying
Predicting
Time-space judgments
Behavior of other highway users
Vehicle capabilities (including own)
Risk
Deciding
Kinds of decisions:
simple
habitual
complex
sudden (high risk)
Executing
Responding with vehicle controls:
steering controls
accelerator
brake
signalling devices
Vehicle Responses
Location
Direction
Speed changes

measured at the end of the course. First of all, some meaningful learning may be unobservable or internal and, therefore, cannot be reduced to performance acts. This is particularly true in the affective domain of beliefs, attitudes and values where appraisal techniques are woefully inadequate. Does this mean that we should not try to develop traits that appear to be beyond objective measurement? The thinking here is that we must turn toward teaching and evaluating all of the traits that research indicates are important in driving, regardless of how difficult they are to measure. We may find that if affective objectives can be defined more precisely than they are at the present, significant changes can be made in the attitudes and values of students.

Fundamental Ideas

Special effort was made to identify fundamental ideas in driver and traffic safety education–those which have wide as well as powerful applicability–and to give these ideas a central role in the curriculum. Simply teaching discrete facts and skills with little regard for their context in the broader structure makes it difficult for the student to comprehend, remember, generalize and apply the learnings. Perhaps we are not giving adequate attention to uncovering the basic ideas in Driver and Traffic Safety Education, and as a result find ourselves all too often teaching details rather than principles. If we focus on fundamental ideas the details will fall into place.

The term "concept" as used in this study refers to a meaningful idea (group of related facts and opinions) that will help young drivers to deal more efficiently and effectively with some aspect of the traffic environment. Some examples are hydroplaning, right of way, risk, negligence, responsibility, empathy, accident, prediction, emotions and warrants. These concepts, when internally lodged, will determine how we react to particular situations, persons and objects. We live and drive in accord with our concepts and values. (Values are discussed in Part IV.)

When concepts are placed in statements, they form generalizations or principles. Here are nine examples selected at random from various units.

1. The right mix of speed, fluid on the road surface and tire tread can result in a vehicle losing all contact with the road *(hydroplaning)*.

2. *Braking distance* varies at a geometric ratio with speed.

3. Fundamental to all *right of way* is the principle that no one is authorized to take the right of way if to do so would cause a threat to life or property.

4. The same driver may be willing to assume more *risk* at one time than another.

5. Drivers decide and act, not according to the way things are, but according to their interpretation of what they are like (*perception-reality*).

6. Skilled and rational responses tend to become disorganized under *emotional stress* or panic.

7. It is better to assume the "*worst*" from other drivers and not have it happen, than to ignore the worst and have it occur.

8. *Alcohol* interferes with the human functions essential to safe and efficient driving performance.

9. Traffic signals placed at intersections where they are not *warranted* increase accidents.

The curriculum resulting from this project has been structured largely in the form of generalizations similar to the preceding examples. Traffic related tasks served as criteria for deciding whether the concepts and generalizations were sufficiently important to justify the time for teaching.

The subject matter of a curriculum is the raw material with which we work at the present time, but it will change. For that reason, an effort was made to highlight concepts that will have more or less lasting value. Not that concepts are everlastingly valid; they need to be re-examined also. Reality cannot be molded to fit the concepts', ideas have to be molded to fit reality. In all probability, however, the following generalization, and most of the others in this study, will be as valid in 1980 as they are in 1970.

> "In predicting the potential movement of other vehicles, an operator should consider the distinctive attributes associated with that class of vehicles."

Although this generalization will continue to be valid, the specific information used to illustrate it will probably need to be revised. In time, the capabilities of today's vehicles (motorbikes, trucks and buses, compacts and sports cars) will change and perhaps new types of vehicles will come upon the scene. And so it will be with many other generalizations; the supporting facts will change.

The degree to which a generalization becomes meaningful to a particular student depends upon the concepts and values already internalized by a student, the teacher's selection of subject matter, and his management of the learning process. In any case the process is not simply transmitting concepts from teacher to student (a pouring-in process) but rather a strategy that involves students in active interaction with the materials, analyzing and making judgments on how to deal with problems. Perhaps we should teach as if we were coaching, striving to get the best possible performance from every learner.

Learning Domains

Underlying the objectives, content and learning activities of the proposed curriculum is the belief that different kinds of "learnings" interact and influence each other. Terms and definitions that will be used are:

> *cognitive learning*–knowledge, comprehension and intellectual skills
>
> *affective learning*–interests, beliefs, attitudes and values
>
> *psychomotor learning*–motor skills

The cognitive and affective domains of learning can never be completely separated. If cognitive objectives are developed, generally there will be a corresponding development of appropriate affective behaviors. For example, when the principle "alcohol reduces inhibitions which control driving behavior" is taught effectively, the student will not only comprehend (cognitive) the full meaning of the principle, but he will also acquire some feeling and attitude (affective) about the idea which in turn will influence his behavior. Our challenge is to find these ideas which have a "two-way stretch," that is, they represent valid subject matter and, in addition, serve to cultivate values which produce wise decisions.

The balance between cognitive and affective learning in a particular learning episode varies. In some cases a great deal of subject matter is acquired with little change in attitudes and values, while on the other hand a small but highly charged idea may produce a significant change in the affective area. For example, a well planned and conducted brake reaction demonstration could markedly influence the thinking and subsequent behavior of the participant, with a limited change in the cognitive area. On the other hand, an informative film or reading assignment may significantly increase the student's knowledge with little immediate change in attitude. One needs to consider more than the results of a single learning experience. Sometimes a situation high in cognitive potential and low in attitude will lay the foundation for value and attitude change in a subsequent experience. As an example, assigning students to acquire certain information may be a necessary prerequisite to a successful group discussion or a role-playing episode. Competent teachers consider how the balance of cognitive and affective aspects fit into their total planning and goals for the course. Furthermore, they do not waste time debating the relative importance of knowledge and attitude because they realize that they go together.

Psychomotor and social skills enable the learner to carry out behavior choices determined by cognitive and affective learnings. This statement applies whether we are talking about a psychomotor skill used in operating the vehicle or a social skill in handling a situation involving alcohol, drugs or emotions. Execution is the ultimate goal and major criterion for judging the effectiveness of the curriculum. ("The proof is in the pudding.") Before execution, however, comes identification, prediction and decision. In turn, the quality of these human functions is determined by our concepts, values and skills–all of which can be influenced through the learning process. (Fig. 5) That is what driver education is all about.

Curriculum Format

The curriculum format includes "Sections," "Units," "Episodes" and "Segments." Each episode includes a page called *Episode Delineation Form* (See page 18) consisting of concepts, behavioral objectives and learning activities. A "concept" represents the fundamental idea in the segment, the "objective" suggests student behavior revealing extent of learning, and learning activities present ideas for developing the desired behavior.

Some of the behavioral objectives can be used as test questions as stated, but most of them serve only as the basis for developing questions, learning activities and media. Take this example.

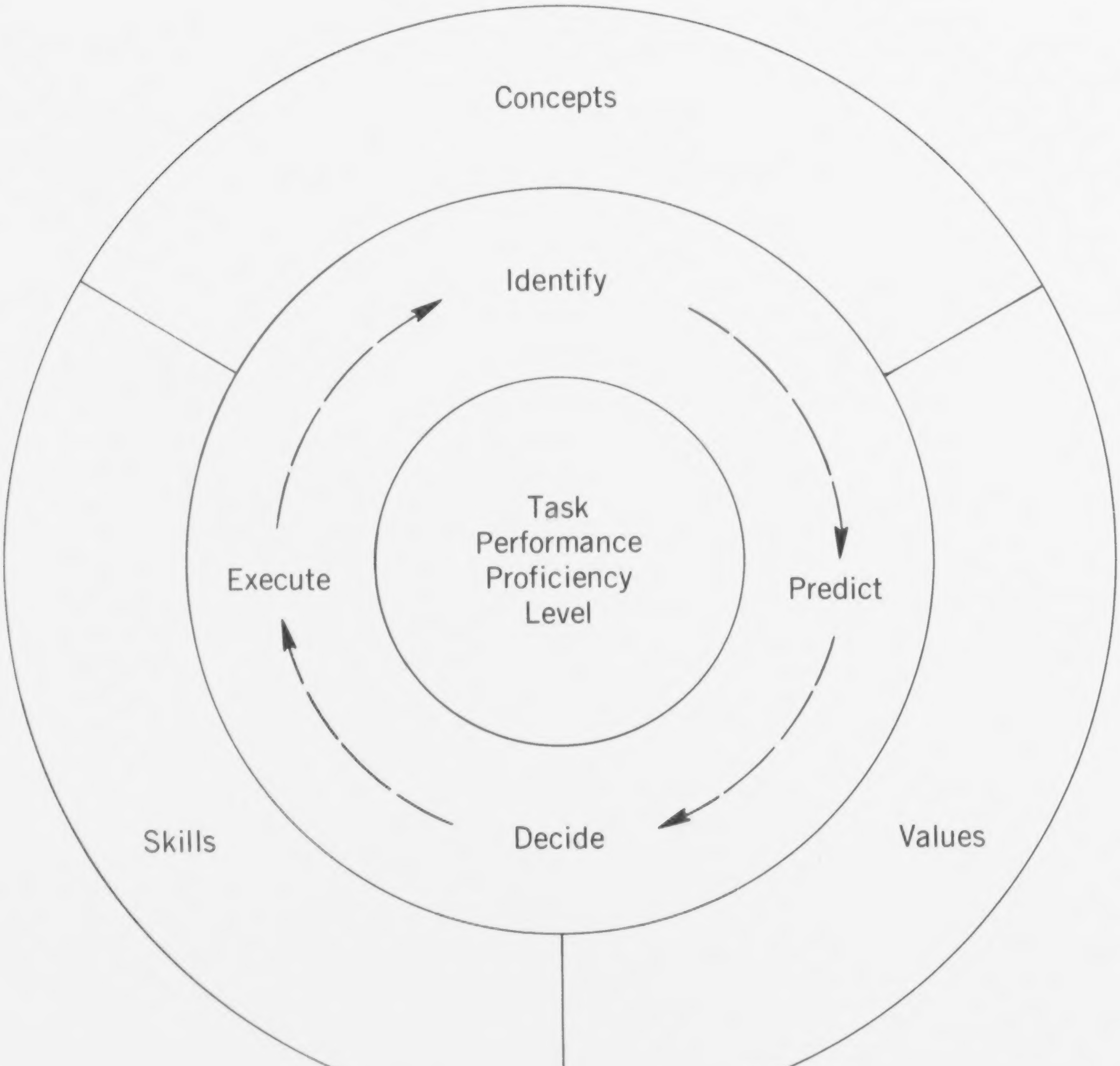
> Given a series of traffic situations (slides or diagrams), students can "spot" view obstructions and select appropriate adjustive measures.

Since visuals of traffic scenes are to be used in this testing situation, they should also be used in the learning or practice situation. In fact, whenever possible teaching and testing situations should be similar. If not equivalent, they should at least be analogous. With this principle in mind, one can see the opportunities for developing learning activities and media from the objectives.

Learning activities are included for only some of the episodes. The project staff felt that a greater contribution could be made by concentrating on overall curriculum structure, behavioral objectives and content. As curriculum planners and teachers in driver and traffic safety education, we need to approach a consensus on behavioral objectives and content. However, agreement on method appears to be less important. More than one route can lead toward developing the same student behavior. Teachers should select their methods on the basis of individual capabilities and available resources. For this reason, and also because of time limitations, learning activities have been omitted in many cases. Hopefully, other curriculum planners and teachers will be stimulated by the proposed behavioral objectives and content in Part III, by the discussion of teaching and learning in Part IV, and as a result develop appropriate learning activities and media.

FACTORS INFLUENCING OPERATOR PERFORMANCE

Figure 5


Concepts
Identify
Task
Performance
Proficiency
Level
Execute
Predict
Decide
Skills
Values

A section on "Content" also accompanies each episode, in addition to the *Episode Delineation Form*. In the content part, each segment concept is woven into a generalized statement which serves as the basis for a behavioral objective. Segment level generalizations and behavioral objectives are on a 1:1 ratio. Supporting ideas (subconcepts) are included for each segment to furnish a source of information for teachers and students. Content places heavy emphasis on generalizations underlying traffic-related decisions and performances. For the most part, prescriptive statements ("Do this"–"Don't do that") are avoided. Instead, typical statements point to cause and effect relationships so the student will be able to make intelligent decisions and perform skillfully. In some cases, operating procedures are included–for example in Section I, Unit C–Critical Situations. However, step by step techniques for performing various maneuvers generally are omitted, since they are identified in many other publications.

Summary

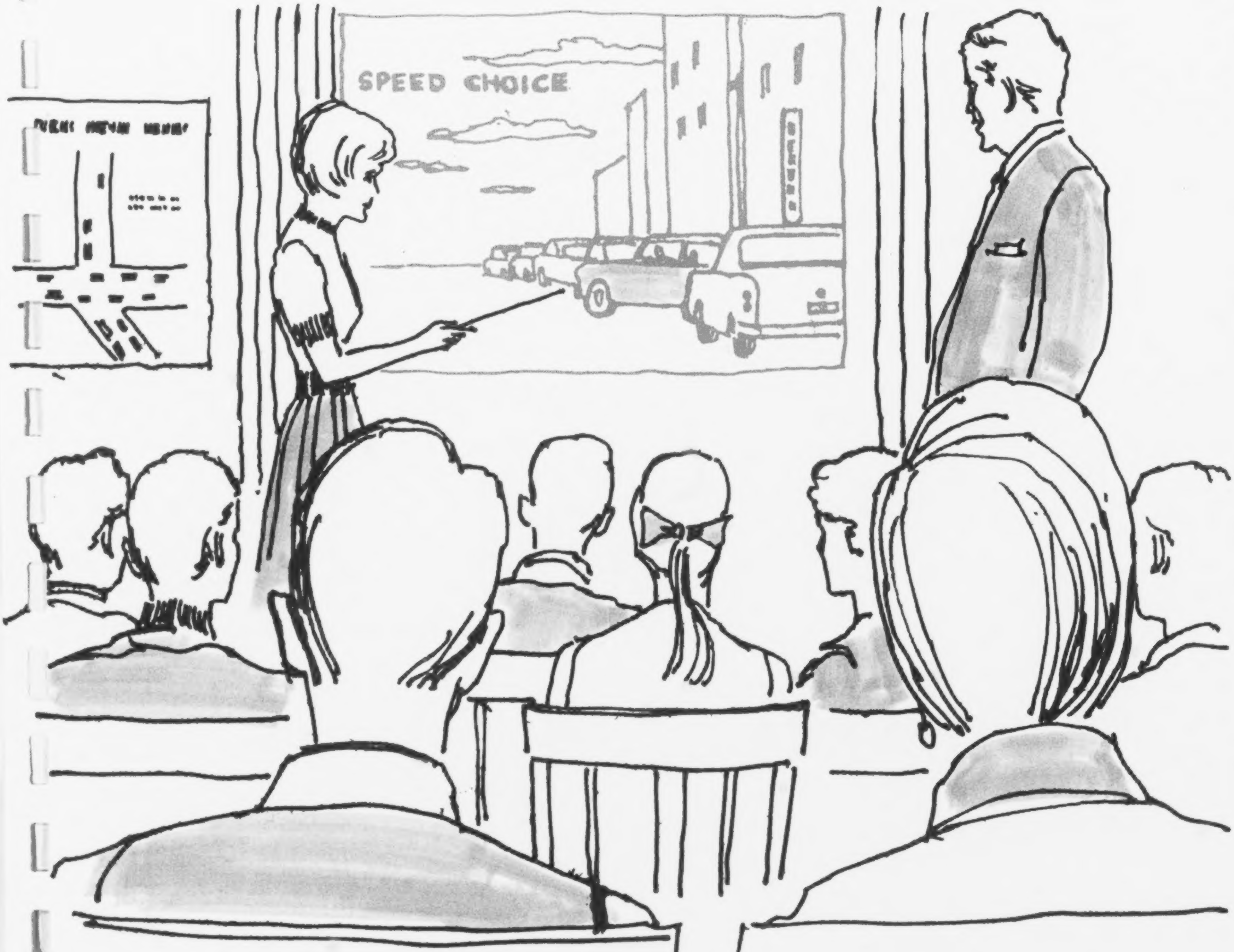
Summarizing the structure and rationale for the proposed curriculum in Part III:

1. Highway traffic related tasks serve as criteria for judging the relevance of curriculum elements.
2. Human functions related to motor vehicle operation (identify, predict, decide and execute) are basic points of contact and connection for the curriculum.
3. Objectives are stated in terms of student behavior which can furnish guidance for teaching and evaluation.
4. Content emphasizes concepts and principles that influence traffic related decision making and performance.
5. Cognitive (knowledge) and affective (attitudes) learnings combine to determine how psychomotor skills are used.

PART III

OBJECTIVES, CONTENT, AND LEARNING ACTIVITIES

Given a slide series of highway scenes to analyze, the student will be able to identify roadway and vehicle conditions that indicate a need to evaluate and perhaps alter the rate of vehicle movement.



DRIVER AND TRAFFIC SAFETY EDUCATION TOPICAL OUTLINE

INTRODUCTION

Unit–The Highway Transportation System

Episode 1.0 Man and the System

SECTION I–ON HIGHWAY TASKS

Unit A–Basic Control Tasks

Episode 1.0 Vehicle and Road Surface Interaction–Basic Concepts
2.0 Directional Control
3.0 Speed Control
4.0 Braking and Stopping
5.0 Maneuvers

Unit B–Interacting With Other Highway Users

Episode 1.0 Human Functions and Motor Vehicle Operation
2.0 Impediments to Vision
3.0 Distractions
4.0 Movement Within Traffic Flow
5.0 Intersections
6.0 Pedestrians and Animals

Unit C–Critical Situations

Episode 1.0 Response Analysis
2.0 Traction Loss
3.0 Vehicle Malfunctions and Failures

Unit D–Controlling The Consequences of Highway Collisions

Episode 1.0 Highway Accidents
2.0 Minimizing Impact Forces
3.0 At the Collision Scene
4.0 Financial Responsibility

SECTION II–READINESS TASKS

Unit A–Operator Fitness

Episode 1.0 Alcohol
2.0 Drugs
3.0 Emotions and Motivations
4.0 Fatigue and Carbon Monoxide
5.0 Other Impairments

Unit B–Vehicle Readiness

Episode 1.0 Vehicle Sub-Systems–Prerequisite Knowledge
2.0 Vehicle Management–Selection and Maintenance

Unit C–Trip Plan

Episode 1.0 Trip Planning and Pre-driving Inventory

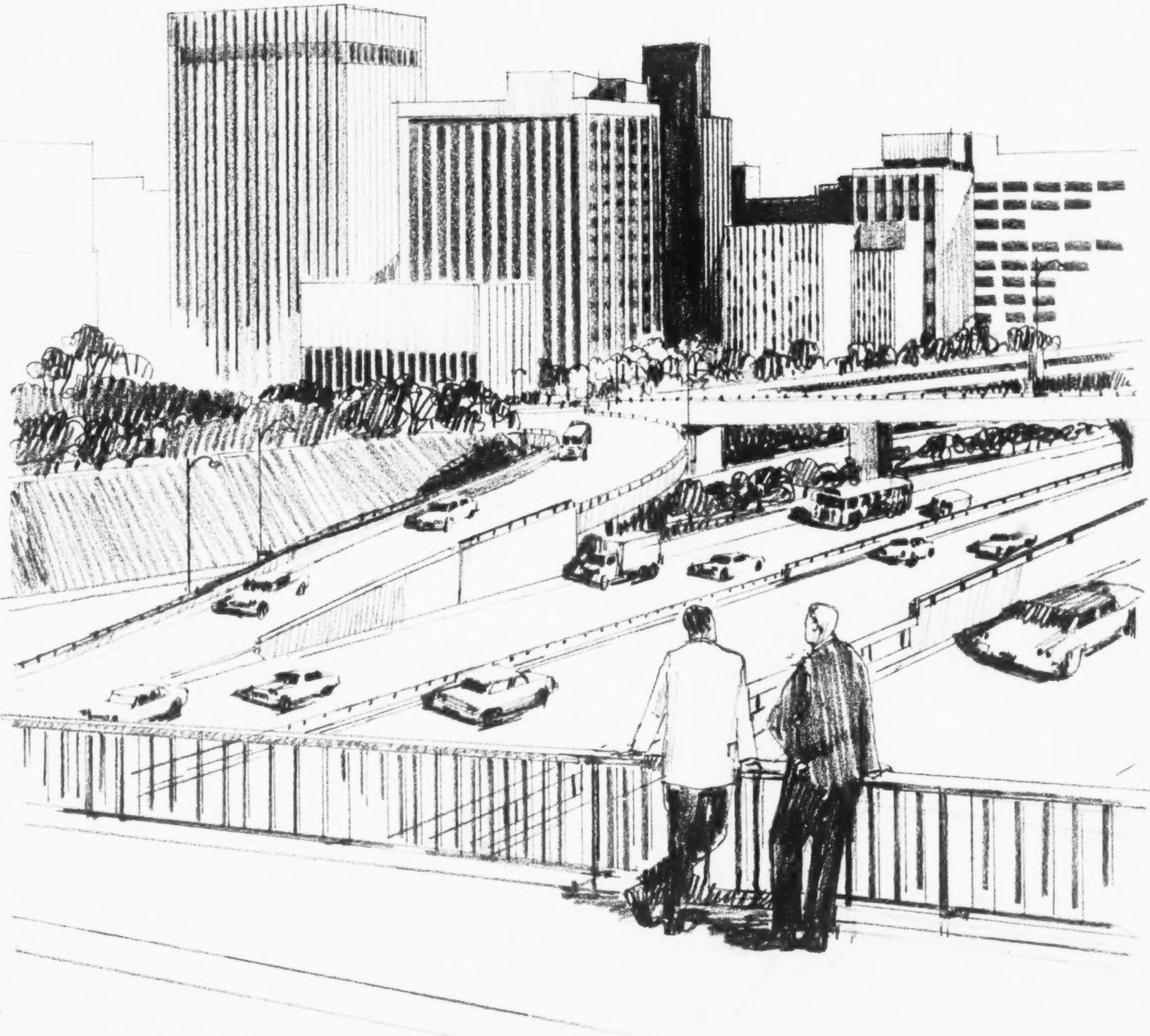
SECTION III–IMPROVEMENT TASKS

Unit A–Self Improvement

Episode 1.0 Risk Acceptance
2.0 Self Analysis and Improvement

Unit B–System Improvement

Episode 1.0 Traffic Law Enforcement
2.0 Traffic Engineering
3.0 Suggestions, Guidelines and Resources For Action



INTRODUCTION

UNIT TITLE: THE HIGHWAY TRANSPORTATION SYSTEM

UNIT GOAL:

Students will be able to define the highway transportation system in terms of its components, goals, management forces, criteria for evaluating its effectiveness, operator and non-operator tasks, and membership requirements.

EPISODE TITLE:

1.0 Man and the System

Episode Delineation Form

UNIT ________ Title: The Highway Transportation System

EPISODE 1.0 Title: Man and the System

EPISODE PURPOSE: This episode is designed to help students acquire a comprehensive picture of the goals, components, and forces involved in the highway transportation system, and to see the varied ways in which they can contribute to system efficiency and improvement. By presenting this overview early, teachers will be able to (1) show students how the learning experiences in subsequent units and episodes will help them relate to the system and (2) initiate a term project to help students learn how to participate in the social and political activities related to traffic management. In regard to the latter, teachers will need to refer students to Section III, Unit B, Episode 3.0 for suggestions and guidelines regarding non-operator activities.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
1.1	System	Identify the characteristics of a "system."	*Teacher-led presentation* revealing the definition, characteristics, and examples of "system." Each student identifies a system that he is familiar with and describes why it fits the definition of a system.
1.2	Highway Transportation System	Describe the major components of the highway transportation system and compare their characteristics with similar components in rail, water and air transportation systems.	Students list the variations in vehicles, highways, and drivers that characterize the highway transportation system, and then compare this system with rail, water and air transportation. (Generalizations formed through this process.)
1.3	Highway Safety Management	Classify the "forces" which are designed to manage the highway transportation system, and describe the function of each. (One sentence for each.)	By appropriate questioning, the teacher will draw out "forces" from the students. Teachers will fill in those that students do not reveal. Visuals would facilitate the learning of the material.
1.4	System Performance Criteria	Identify the criteria that can be used to evaluate the overall performance of the highway transportation system, and compare these measures with the goals of individual highway users.	Teacher elicits answers from students through a questioning process and fills in information as needed.
1.5	Driving Task	Summarize the nature of the driving task: purpose, major performance requirements, and the role of safety.	Questions: What is the major purpose of operating a motor vehicle? What are the major obstacles to accomplishing the mission? What is the underlying reason for driving in a safe manner?
1.6	Membership Requirements	Identify and appraise the mental and physical requirements that individuals must meet to acquire and maintain an operator's license.	Students study the state vehicle code (homework) prior to a brief class recitation period designed to clarify the main requirements and issues.
1.7	Non-operator Responsibilities	Distinguish *non-operator* from *operator* tasks.	(See the suggestion under 1.7 of "Content.")

CONTENT

1.0 The efficiency of the highway transportation system depends upon the performance of both public officials responsible for developing and managing the system, and highway users as they relate to the system.

1.1 A system is an orderly arrangement of components and sub-systems that serve to perform some task in a given environment.

a. Components inter-relate and interact with each other.

b. Vast majority of systems are composed of men and machines.

c. Man needs to be challenged, but not overburdened.

d. In any man-machine system some tasks are better performed by men and other tasks are better handled by machines.

e. Human factors engineer attempts to fit the machine and the environment to man's capabilities and limitations, while education and training attempt to fit man to the machine and his environment. (Both efforts strive to minimize error.)

f. System effectiveness is the ability of the system to do the job it was intended to do.

1.2 The highway transportation system, a sub-system of the national transportation system, is composed of many man-machine-environment combinations interacting in a loosely coordinated fashion.

a. Millions of machines of varying sizes, design, function, performance capability, age and condition are included.

b. Millions of miles of roadway, and other physical entities on the roadway and the roadside, which affect the movement of the vehicle, vary in design, construction, and condition. (Many highways are inadequate.)

c. The machines are operated on the roadways by millions of operators of varying ages, skills, knowledge, temperament, physical attributes and goals.

d. Because of the demands driving places on the operator, and the serious consequences which can result from poor performance, driving is one of the most hazardous activities people engage in. Highway transportation is more hazardous than rail, water and air transport, because:

(1) these other means of travel operate under unified control, following pre-determined schedules on their own more or less exclusive right-of-way, with very little traffic congestion other than at ports or terminals;
(2) by contrast the highway scene is more congested because many units meet on the same travelway with no one having exclusive right-of-way; and
(3) except for operators of truck and bus fleets, most highway vehicle operators have not had to meet advanced qualifications; in contrast, air, rail and water movements are largely mass transport, controlled by highly qualified operators, adhering to rigid safety rules, and having the benefit of scientific systems of signalling and traffic control.

1.3 Developing and managing the highway transportation system requires many interconnecting forces working together at the federal, state and local levels.

a. Highway, traffic and vehicle engineers strive to provide highways, operational controls and vehicles that will enable people to reach their destination safely, conveniently and economically. (Physical control.)

b. Laws and ordinances supply standards of motorist and pedestrian conduct, and serve as a legal framework within which officials can carry out their duties stemming from vehicle operation and pedestrian traffic.

c. A driver licensing program helps to limit vehicle operation to persons physically and mentally qualified to drive, and also prevents needless denial of the right to drive.

d. Motor vehicle registration procedures furnish rapid identification of vehicle ownership for investigative, law enforcement and other administrative and research purposes; and in addition, serves as the basis for income from registration fees.

e. Police traffic supervision represents an official control designed to ensure safe and efficient movement of traffic on streets by:

(1) directing and controlling traffic;
(2) enforcing traffic laws; and
(3) investigating accidents.

f. Traffic Courts, another official control, determine guilt or innocence and impose penalties in accordance with law on those who are convicted of traffic violations, and in so doing create the impressions which largely determine the citizens' attitude toward traffic law enforcement and the judiciary.

g. Driver and Traffic Safety Education is designed to improve the competency of highway users. There are education programs for improving competency of public officials and others engaged in work related to traffic management.

h. A good traffic records system, including information regarding drivers, vehicles, volumes of traffic, highways and accidents, is the base of all aspects of a coordinated traffic safety and vehicle usage program.

i. An effective program of emergency medical care and transportation for those injured in traffic accidents will reduce the number of deaths and the consequences of injuries.

j. Federal legislation was enacted in 1966 to (1) require that all new vehicles will incorporate safer features progressively, and (2) establish a federal mechanism for cooperating with states and communities so they will have coordinated and effective highway safety programs.

k. Organized citizen support groups, cooperating with public officials, are essential for an optimum highway transportation system. (See Section III, Unit B, Episode 3.0 for the opportunities and responsibilities of private citizens related to improving the highway transportation system).

1.4 The overall performance of the highway transportation system can be assessed in terms of:

a. the number of people and the amount of goods which can be moved;

b. the geographical locations between which movement can occur on roadways;

c. the time it takes to complete movement between various locations;

d. collisions which prematurely terminate or interrupt movement (see Section I, Unit D, Episode 1.0 for information on the traffic accident problem); and

e. cost factors.

1.5 The task of driving a motor vehicle occurs within the context of the functioning highway transportation system.

a. Individual drivers strive to move their vehicles from one location to another as safely, economically, conveniently and comfortably as possible.

b. The individual's goal is reached by selecting paths and velocities coordinated with the paths and velocities of other drivers and pedestrians (often in close proximity) striving for their individual goals. In this sense driving is a social activity.

c. The operator's task (perceptual-motor) is essentially the same regardless of the vehicle he is driving. He must:*

(1) scan and search to *identify* key cues in the environment;
(2) interpret the cues and *predict* what implications they have for his behavior;
(3) *decide* upon an appropriate course of action; and
(4) *execute* the decision through a complex coordination of hands, feet, senses and mind.

d. The major performance requirements in the driving task are placed on the operator by the environment, which is constantly changing due to variations in the:

(1) roadway surface and design;
(2) near-path physical structures;
(3) traffic density and movement patterns;
(4) traffic signs and signals;
(5) pathway visibility; and
(6) weather.

e. Safety must weigh heavily in the decision-making process if the task is to be accomplished successfully. (Safety is a means to an end).

1.6 To acquire and maintain membership as a vehicle operator in the system, individuals must comply with driver license and motor vehicle registration laws.

a. Learner's permits and licenses are symbols of different kinds of membership in the system.

b. A variety of physical and mental requirements must be met before one can receive a learner's permit.

c. All of the states require a driver's license examination to insure a minimum level of operator competency.

(1) Unfortunately the driver licensing examination measures only rudimentary knowledge and skills, plus some physical traits, but does

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*A complete episode is devoted to these functions later—see Section I, Unit B, Episode 1.0.

not guarantee that the person is socially and emotionally mature.

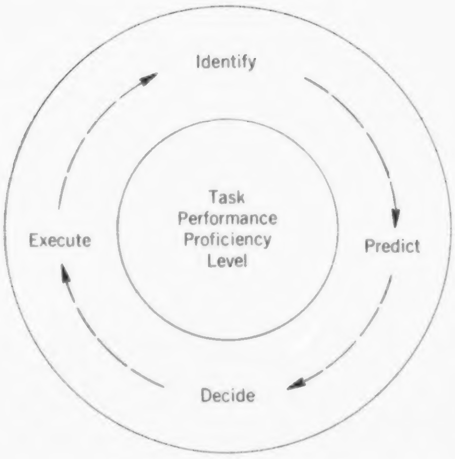
(2) Periodic re-examinations can help motor vehicle administrators to identify those persons who have acquired physical disabilities or whose knowledge and driving skills have deteriorated.

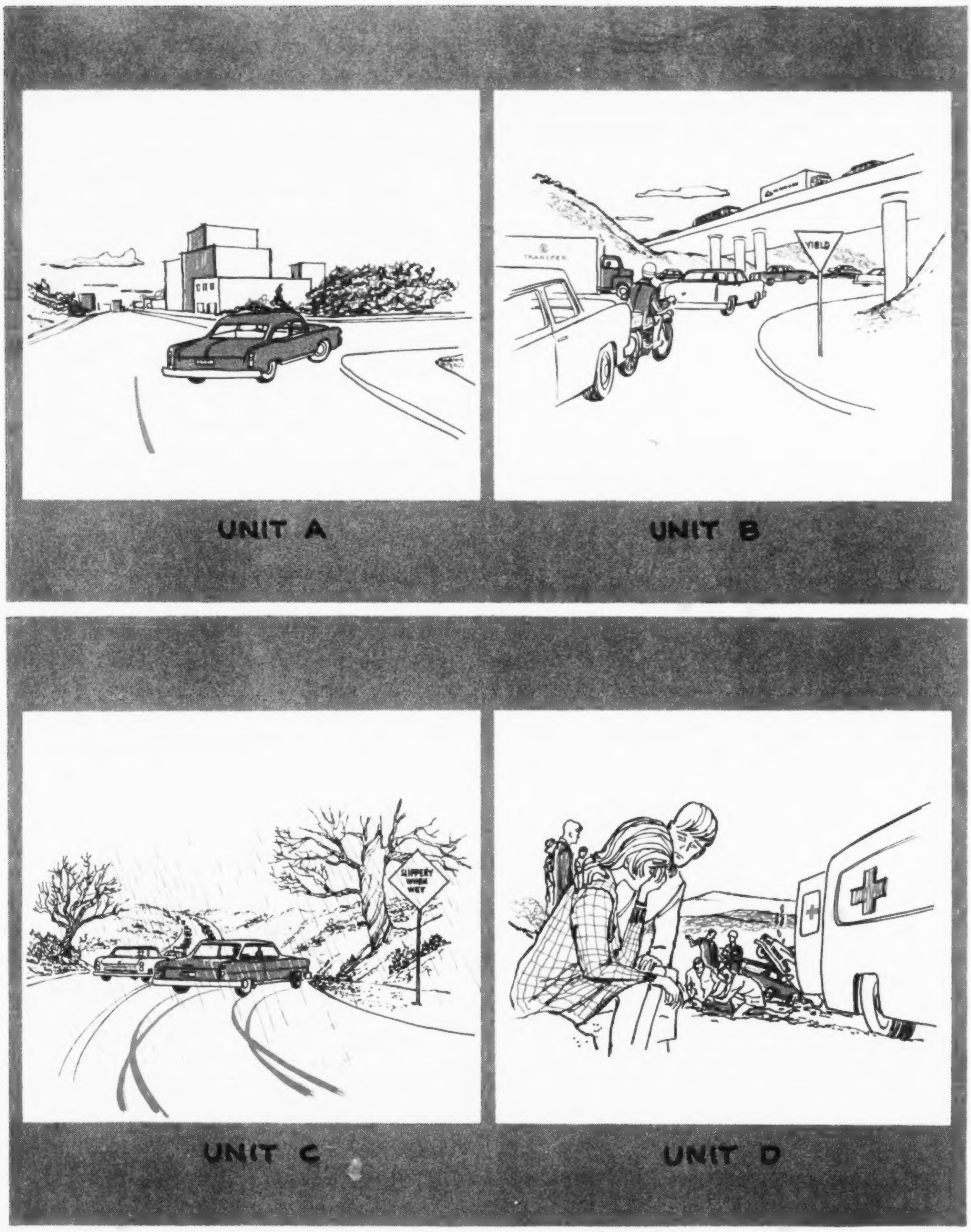
d. A basic ingredient of a quality driver licensing and driver improvement program is a driver record file which includes convictions, accident reports, complaints about the driver, warning letters, test scores, and other personal information. By exchanging information on drivers, states are creating a means by which a driver's complete records (countrywide) can be accumulated and acted on as a whole by the licensing state.

1.7 Our responsibility with respect to the highway transportation system extends beyond what we do as vehicle operators; it includes non-operating activity that contributes to overall system efficiency and improvement.*

---

*The project staff suggests that teachers delay any depth treatment of this generalization. However, if the teacher would like to involve students in an action project related to the generalization, that activity should be initiated fairly early in the course to allow ample time for data gathering. At that time, the teacher should refer students to Section III, Unit B, Episode 3.0, where suggestions and guidelines for system improvement projects are included, along with other ideas related to 1.7.





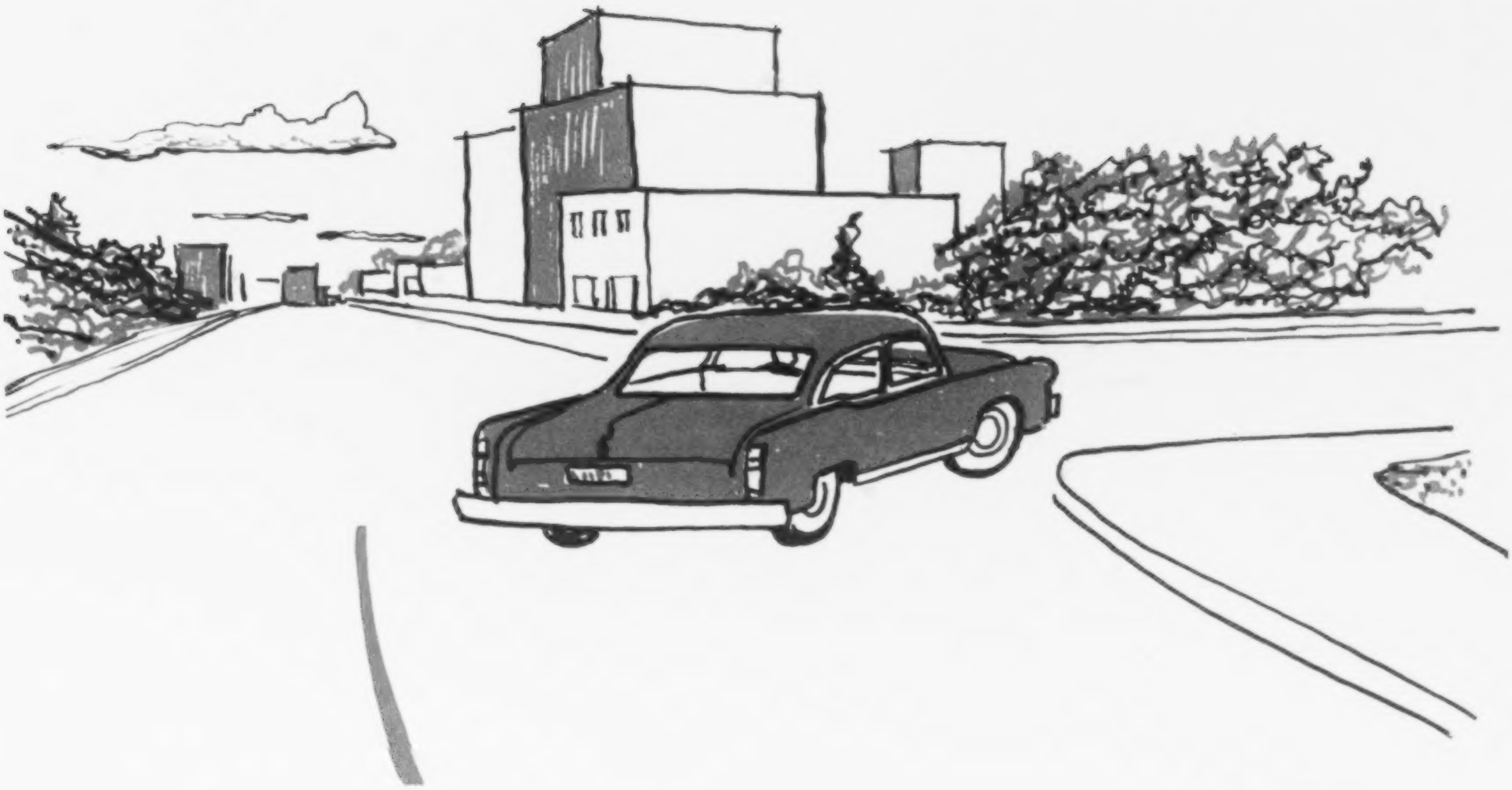
SECTION I - ON HIGHWAY TASKS

Section Goal:

Students will be able to perform motor vehicle operational tasks under varying road and traffic conditions with at least entry-level proficiency and, more important, the potential to *become* expert. In addition, they will be prepared to handle themselves appropriately at a traffic accident scene.

Unit Titles:

A. Basic Control Tasks
B. Interacting With Other Highway Users
C. Critical Situations
D. Controlling The Consequences Of Highway Collisions



SECTION I–ON HIGHWAY TASKS

Unit A - Basic Control Tasks

Unit Objective:

Students will be able to control the vehicle and perform basic maneuvers to the point where they can enter light traffic under teacher supervision.

Episode Titles:

1.0 Vehicle and Road Surface Interaction:
Basic Concepts
2.0 Directional Control
3.0 Speed Control
4.0 Braking and Stopping
5.0 Maneuvers

Episode Delineation Form

UNIT A Title: Basic Control Tasks

EPISODE 1.0 Title: Vehicle and Road Surface Interaction: Basic Concepts

EPISODE PURPOSE: The operator communicates with his vehicle and the roadway through the steering control, accelerator and braking control. Whether or not the vehicle responds as anticipated depends upon the effectiveness of the control devices plus the friction between the tires and the road surface. An understanding of the concepts and the principles related to tire-roadway interaction will help the young driver maintain equilibrium between his vehicle and the roadway. The purpose of this episode is to develop that prerequisite understanding.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
1.1	Friction	Classify the (a) kinds of friction (static, sliding, rolling and internal) and (b) general conditions that determine the amount of friction between two surfaces.	
1.2	Traction	Describe the role of traction in maintaining vehicle control.	
1.3	Road Surface Factors	When shown pictures of roadways, identify and appraise conditions that influence the gripping efficiency of the roadway.	
1.4	Tires	When given a series of situations related to tire selection and condition, identify the implications for traction.	

CONTENT

1.0 Control of vehicle movement depends substantially upon the friction on small spots where the flattened out part or "footprints" of the tires contact the roadway.

1.1 Friction is the resistance to motion between two surfaces.

a. Four basic kinds of frictions are:

(1) *static friction* – the holding force between two surfaces at rest;
(2) *sliding friction* – the resistance to motion between two surfaces which are moving across each other (somewhat less than static friction);
(3) *rolling friction* – the resistance to motion of a rolling object like a ball, cylinder or wheel (small compared to static or sliding friction, which is the reason for using wheels instead of sled runners); and
(4) *internal friction* – the resistance to motion within elastic objects (tires get warm from internal friction as they flex).

b. Amount of friction between two surfaces depends upon the:

(1) substance of the material – metal, wood, rubber (the softer the material, the more friction);
(2) roughness of the surfaces (the rougher the surface, the more friction);
(3) amount of force pushing the surfaces together (the more force, the more friction); and
(4) presence of "lubricants" – oil, water, leaves, etc. – which tend to hold the surfaces apart, thereby reducing friction.

c. Amount of friction between two surfaces (coefficient of friction) is calculated by dividing the amount of force necessary to pull one surface over another by the amount of force pressing the two surfaces together (weight).

1.2 Traction (adhesive friction) is essential to vehicle control.

a. Traction is needed on the drive wheels to make the vehicle go, on the front wheels for steering, and on both front and rear wheels for directional control and braking.

b. A spinning wheel, (sliding friction) does not provide as much traction as a rolling wheel; therefore, the skill of starting a car on a slippery surface lies in applying the power to the drive wheels so they do not lose their grip on the surface.

c. It takes more force to start a vehicle moving than it does to maintain movement, because (1) static friction is greater than sliding friction and (2) inertia must be overcome. (A body at rest tends to remain at rest).

d. Normally, a vehicle moves in the direction the wheels point, because the "rolling friction" of wheels moving forward or backward is much less than the "sliding friction" of side movement. Exceptions are:

(1) when centrifugal effect in a turn is greater than the frictional force of the tires, the tires will slide sideways.
(2) when brakes are applied hard enough to slide the tires, there is no rolling friction.

e. Although traction is increased by the weight of a vehicle, a heavier vehicle will not stop in a shorter distance, because the added traction is balanced by the added inertia of that weight.

1.3 Many factors affect the gripping efficiency of road surfaces.

a. Surface materials (concrete, asphalt, gravel and dirt) have different coefficients of friction.

b. Dry surfaces have a much greater gripping efficiency than when wet.

c. At the beginning of rain, particularly after a dry spell, the water combines with oil and dirt of the surface to form an emulsion that is extremely slippery.

d. Loose sand and gravel, stone chips, mud, wet leaves, oil and grease tend to lower gripping efficiency also.

e. Ice and snow provide very little frictional grip.

f. Ice patches under an overpass, around shaded curves and other spots blocked from the sun provide a deceptive hazard because they thaw more slowly.

g. For the operator of a two-wheeled vehicle, railroad tracks, steel bridge expansion joints, lattice-floored bridges, even dew on a metal manhole cover create a traction problem.

h. As temperature rises within the freezing range, ice and to a less degree snow, becomes much more slippery (braking distance doubles with a temperature rise from 0 to 32° fahrenheit).

i. Bridges freeze before other road surfaces, and also thaw first.

j. Bumpy washboard roads also greatly reduce the friction grip of tires on the road and result in difficult steering and braking. (The vehicle suspension system helps to keep the wheels on the road surface.)

k. Coefficients of friction are likely to be the lowest at approaches to intersections (a particularly bad place) from the wear of vehicles starting and stopping and also oil drippings from cars and trucks.

1.4 Tires are an integral part of the braking system, the steering system, and the drive train that transmits the power from the engine to the roadway.

a. Tire treads provide traction on wet surfaces by furnishing an outlet for water squeezed by the tire groovings as they cut into the film of water.

b. The groovings of tire treads also provide ventilation to combat heat build up caused by friction of flexing treads.

c. Variance in tire tread depth and inflation pressure can create steering difficulties, instability and uneven braking. Rotating tires at regular intervals helps to equalize the wear of all five tires.

d. Letting air out of tires does not increase traction; in fact, it may even increase the tendency to skid on turns

e. Either overinflation or underinflation of tires causes an improper contact with the road surface and also causes excessive wear.

(1) Underinflated tires cup in the center causing shoulder wear and difficult steering especially in cornering.
(2) Underinflated tires overheat from friction, caused by sidewall flexing which reduces the strength and durability of the tires.
(3) Wear confined to the center of the tire indicates that the tire has been overinflated.
(4) Overinflated tires are easily damaged because the cords cannot flex and absorb road shock.

f. Snow tires (including studded tires) improve traction and stopping distance on ice and snow, but tire chains are more effective under those conditions.

Episode Delineation Form

UNIT A Title: Basic Control Tasks

EPISODE 2.0 Title: Directional Control

EPISODE PURPOSE: This episode will help the student examine the man-machine-roadway interaction with respect to directional control, as a means of developing capability to position his vehicle in selected paths on straight and curved roadways.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
2.1	Line of Sight	Explain why seating position, line of sight and manipulation of the steering control all influence the operator's ability to maintain directional control.	
2.2	Steering and Suspension System	Identify the symptoms and possible consequences on directional control of (a) front end misalignment, (b) defective steering mechanism, and (c) weak shock absorbers.	
2.3	Weight, Speed and Vehicle Profile	Relate weight, speed and vehicle profile to directional control.	
2.4	Two-wheeled Vehicles	Identify special problems–related to directional control–confronting operators of two-wheeled vehicles.	
		Culminating Objective: In the driver education car, students demonstrate their ability to maintain proper lane position over a selected route that is relatively free of other highway users.	

CONTENT

2.0 Reliable and accurate directional control depends upon multiple driver-vehicle-environmental factors interacting in a closely related manner.

2.1 Centering the line of sight down the path the car should travel, and steering toward the center of this selected path, will help to prevent over steering and under steering.

a. Good seeing begins with good seating.

(1) Sit erect and squarely behind the wheel with eye level well above the top of the steering wheel.
(2) To look backward is physically awkward, but it is the only way to get the whole picture when backing the vehicle.

b. Constant eye movement helps to prevent both the fixed and the blank stare ("captured attention"), enabling the driver to maintain continuous awareness of his relationship to the roadway.

(1) Center on the path ahead.
(2) Scan the scene continuously.
(3) Check mirrors and dash periodically.
(4) As speed increases, search farther ahead for environmental cues that may affect course of action.

c. Even on a straight road a car will not "hold the path" unless the driver is looking ahead, recognizing each movement away from the desired path, and making early corrections for each deviation (continuously steering).

d. Position of the hands on the steering wheel may vary with the design of the seat, the length of the driver's arms, muscular differences, and speed of travel. In any case the hand position should be where the driver can steer best.

2.2 Properly functioning and precise steering and suspension systems allow changes in direction to be made accurately and in close accord with movements of the steering wheel.

a. The steering system and front tires utilize friction to provide maneuverability.

(1) As the driver turns the steering wheel the turning action is transmitted through a gear to the arm and rods that control the front wheels.
(2) When the front wheels are in proper alignment (angles at which wheels are positioned), they allow the tires to roll parallel to each other when traveling straight ahead without scuffing, dragging, or slipping. Misalignment can result from worn parts or hard jolts to the front end.
(3) A properly functioning steering system is particularly important in fighting cross winds, negotiating sharp curves, and during evasive actions in emergencies.
(4) Power steering, through reduced gear ratios, provides fast, positive steering under normal circumstances, and also helps the driver to retain control under adverse circumstances (blowout, chuck holes, soft shoulder, etc.).
(5) A driver should be able to recognize any malfunctions of the steering system such as steering wheel "play," hard steering, pulling to one side, "shimmy," poor recovering and self-centering, noise and tire squeal.

b. Shock absorbers lend firm control over spring action and in so doing help to provide directional stability.

(1) Shock absorbers make it possible for tires to maintain a nearly continuous, firm contact with the road surface, to produce a smooth and comfortable ride.
(2) Shock absorbers have limited life and lose effectiveness gradually, which can be detected by: swaying on curves, uncontrolled wheel bounce and bottoming on bumps; excessive rocking and dipping motions when moderate stops are made; and lack of vehicle stability at highway speeds.

2.3 Weight, speed and vehicle profile influence directional control.

a. The effects of side wind forces increase as the weight of the car decreases, but a heavy vehicle is not immune to the effects of side wind (danger of sudden shifts of wind direction velocity; also the danger of driving into a head wind and then suddenly turning a corner).

b. Trailers, campers and vehicles with a cartop carrier are especially susceptible to wind forces due to their higher center of gravity.

c. As car speed increases, the angle decreases at which direction changes can be made safely. For example, a lane change at 15 mph could be made at a 45° angle while at 60 mph a smaller angle would be required.

2.4 Maintaining directional control on a two-wheeled vehicle requires a higher level of skill than driving an automobile. The rider and the vehicle act as a system to *control* and *balance* the machine.

a. Small bumps, obstacles in the road and other surface conditions which may not even be noticed by an automobile driver, will frequently challenge the two-wheeled vehicle operator.

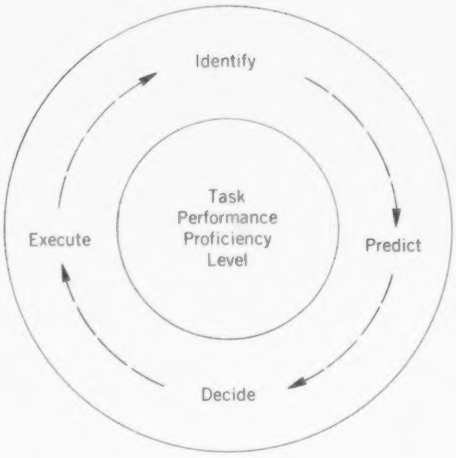
(1) Railroad tracks should be crossed as near to a 90° angle as possible, to avoid skidding and catching the wheels in them.

(2) The more slippery the surface, the closer to vertical the vehicle should be kept.

(3) By driving to the left side of a roadway lane, the grease strip in the center of the lane and the bumps along the road edge can be avoided.

(4) If you have to hit a small obstacle or bump, hit it head-on, grasp the handlebars firmly, and raise slightly from seat to protect your spine from the jar.

b. If articles are carried in a saddle bag or a carrying rack, *both* hands are free for using controls and maintaining good balance. Although a rider may feel secure riding with one hand he cannot handle the slightest emergency.



Episode Delineation Form

UNIT A Title: Basic Control Tasks

EPISODE 3.0 Title: Speed Control

EPISODE PURPOSE: This episode will help the student to examine the man-machine-roadway interaction with regard to rate of movement, as a means of developing the capability to judge appropriate speeds for roadway conditions. Special emphasis will be given to speed control on turns and curves.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resource
3.1	Source and Transmission of Power	Given a diagram of the engine and power train, trace the power from its origin in the cylinders to the rear wheels describing the function of the clutch, transmission, drive shaft and differential.	
3.2	Kinetic Energy	Apply the concept of kinetic energy to vehicle movement.	
3.3	Acceleration	Define "acceleration" and state the factors that determine the acceleration capability of vehicles.	
3.4	Deceleration	Define "deceleration" and describe non-braking techniques for safely and efficiently decelerating a moving vehicle.	
3.5	Cornering	Identify vehicle and environmental factors that determine speed selection on curves.	
3.6	Speed Choice	Given a series of highway scenes to analyze (slides), identify roadway and vehicle conditions that indicate a need to evaluate and perhaps alter the rate of movement.	
3.7	Speed Laws	Classify the various kinds of speed limits.	
		Culminating Objective: In the driver education car, demonstrate good judgment in selecting speed alternatives for various kinds of roadway types, surfaces and conditions.	

CONTENT

3.0 The speed of a vehicle must be adjusted by the driver in accord with vehicle and personal capabilities, environmental conditions, man made laws, physical laws, and the driver's directional objectives.

3.1 Power, available to the driver via the accelerator pedal, is made possible in internal combustion engines, by the interaction of the fuel and electric systems, assisted by the lubricating and cooling systems.

a. The burning of a gasoline-air mixture in an enclosed space (cylinder) is the source of power.

b. Most vehicles have four, six or eight cylinder-piston-spark plug combinations each fired at a different moment to provide a continuous and smooth power production.

c. Four strokes of the piston represent a cycle repeated many times over which is the "heartbeat" of motoring (intake, compression, power and exhaust.)

d. A supply of high voltage electricity is supplied to each spark plug in proper order and timing by the distributor, in cooperation with other components of the ignition system.

e. When the ignition and starter switch (usually combined) is turned on, the electricity flows from the battery to the small electric starter motor which spins and cranks the gasoline engine.

f. The lubricating and the cooling systems are needed to keep the engine going.

g. The engine's power is transmitted from the engine through the transmission, the drive shaft, and the differential to the car's rear wheels. (power-train)

3.2 A moving automobile, just as any other body in motion, possesses what is known as kinetic energy produced by its mass (weight) and its velocity.

a. The potential energy stored in gasoline is changed to kinetic energy by the car's engine.

b. Kinetic energy (momentum) keeps the car rolling when the foot is removed from the accelerator and there is no help from the engine.

c. Kinetic energy increases in a geometric progression (as the square of the speed).

d. To stop a moving vehicle, kinetic energy, which cannot be destroyed, must be converted in form to heat by rolling to a stop, braking to a stop, or colliding with an obstacle.

3.3 Acceleration, the vehicle's capability to increase from a given speed or stationary position to a higher speed depends upon a variety of factors.

a. Engine power and gear ratio are dominant variables in determining acceleration capability.

b. Other factors influencing acceleration are:
(1) traction of the drive wheels;
(2) driver selection of proper gear ratio; and
(3) the driver's use of the accelerator pedal and related feedback.

c. To accelerate upgrade, the engine has to overcome the force of gravity in addition to the usual work of moving the car.

3.4 Deceleration, a decrease in the rate of speed of the vehicle, can take place through means other than braking.

a. When the pressure on the accelerator pedal is decreased, the car slows due to a retarding force of the engine compression, air resistance, and frictional forces between the tires and the road surface and in the moving parts of the engine and power-train.

b. Downshifting (selecting a lower gear ratio in a manual transmission car), in combination with less pressure on the accelerator, produces a sufficient retarding force for control in some situations and also saves brake linings.

c. On a down grade the driver can compensate for the pull of gravity by releasing the accelerator, braking or shifting to a lower gear depending upon the degree of slope.

d. Taking your foot off the accelerator suddenly creates an effect that is similar to applying your brakes, a reality to be considered on slippery surfaces.

3.5 The tendency of a moving body to continue at the same speed and in the same direction (inertia) unless another force is applied confronts the vehicle operator as he strives to maintain directional control during turning movements.

a. On a curve the turning of the front wheels is the force applied to change the direction of the vehicle (provides a side thrust).

b. In a curve, friction and the force of gravity combine to help keep your car from skidding off the roadway.

c. "Centrifugal" effect, a term of convenience to describe the effect of inertia when a car rounds a curve, varies at a geometric ratio–the square of the speed.

(1) Car speed is the most important variable in controlling a vehicle on a curve, because of its dominant influence on centrifugal effect, and is a factor over which the operator has direct control.
(2) As the radius of the turn is reduced, the centrifugal effect is increased and consequently the slower you will have to drive to get around it safely.
(3) Centrifugal effect increases directly with the weight of the vehicle; however, an increase in the coefficient of friction due to the added weight helps to balance this negative factor.

d. Besides the radius of the curve and the weight of the vehicle, other environmental, vehicular and operator factors determine the safe speed for curves.

(1) When a vehicle is cornering, the front wheels lead the rear wheels in such a manner that the tracks of the rear wheels are inside those left by the front wheels.
(2) The coefficient of friction between the tires and the road surface is the most significant factor in determining the safe speed on a curve.
(3) Whether the road is banked, flat or crowned makes a considerable difference in the safe speeds for negotiating a curve. (Crowned roads are banked the wrong way for a left hand turn.)
(4) Properly functioning shock absorbers increase cornering ability as they work with friction and gravity to combat centrifugal force.
(5) The dimensions and weight distribution of a vehicle have a lot to do with its cornering stability and the ease with which it can be handled on turns and curves.
(6) Proper tire pressure is important for optimum vehicle performance on a curve. Cornering ability tends to improve with the increase of pressure at a constant load, because of the increase in sidewall stiffness.
(7) Over steering on a turn generally results from accelerating too soon or failing to return the steering wheel to straight ahead soon enough.
(8) Braking the vehicle after entering the curve will tend to play into the hands of inertia and cause the vehicle to plow straight ahead on a tangent to the curve.
(9) If the driver enters a curve below the critical speed (speed at which frictional forces will break loose) he can accelerate coming out of the curve.
(10) In determining the safe speed for curves, engineers have considered vehicle and driver capabilities and also the physical forces involved.

3.6 Proper choice of speed is a major tool to be used in coping with highway hazards. As speed increases the time available for identifying, predicting, deciding and executing decreases.

a. Objects and obstructions on or near the intended path of the vehicle (rocks, glass, barricades, fallen branches, curbs, poles, mailboxes, etc.) create a hazard that drivers must reckon with by speed and/or direction adjustment.

b. Accurate speed adjustment is particularly critical on older roads built for cars of their day and frequently inappropriate for the characteristics of modern vehicles. Some examples are:

(1) numerous curves and hills;
(2) narrow lanes and bridges;
(3) low, narrow and soft shoulders;
(4) many near-roadway obstacles;
(5) changes in the number of lanes;
(6) poor or no markings; and
(7) deteriorating edges, chuck holes, etc.

c. Any speed can be excessive.

d. The small amount of time gained by increased speed (80 mph compared to 70 mph) does not justify the added risk.

e. A driver's sense of speed, not particularly keen at best, is distorted further under certain conditions (velocitization).

(1) The type of vehicle being driven affects the driver's sense of speed (height of eyes above the road; noise level, and vibration level).
(2) Cars seem to be moving faster when the windows are open.
(3) There is a tendency for sustained high speed driving to dull a driver's judgment of speed.
(4) Glancing frequently at the speedometer will help the driver to remain aware of the speed (particularly important on the freeway exit ramps and for a while after leaving the freeway).

3.7 Vehicle codes include more than one kind of speed limit.

a. Absolute speed limits, both maximum and minimum, serve as a guide to the driver in selecting appropriate speeds for varying conditions.

(1) Persons drive in a variety of environments for the first time and, therefore, need some advice in respect to the selection of a reasonable speed.
(2) The underlying principle is that above or below certain limits speed in and of itself is dangerous and therefore illegal.
(3) Maximum speed limits vary with types of vehicles and with times and locations.
(4) A maximum speed limit does not give the operator permission to go that fast, it merely suggests the speed at which he may travel under ideal conditions.
(5) Speed limits are or should be determined by engineering studies which take into account natural laws.

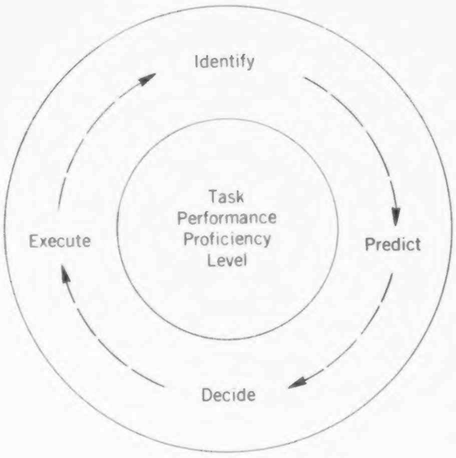
b. In addition to absolute speed limits, drivers at all times operate under a basic speed law.

(1) This regulation compels the driver to use good judgment in scaling down the absolute speed limit to fit the conditions prevailing at a given time and place (reasonable and prudent speed).
(2) Although there is less chance that the driver will be cited for violating this speed law, compared to the absolute, it is a more important law for him to self-enforce insofar as his and others' safety is concerned.

c. Some states include a prima facie speed law which combines features of both the absolute and the basic speed law.

d. Data tends to show greater heed is paid to speed advisory signs, warning drivers of a hazardous situation, than to the regular speed limit signs.

e. Warning signs (diamond shape) are usually intended to help the driver perceive a hazardous situation – bring the information to the driver in advance of the point where he could see it, especially where visibility is limited.



Episode Delineation Form

UNIT: A Title: Basic Control Tasks

EPISODE: 4.0 Title: Braking and Stopping

EPISODE PURPOSE: This episode will help the student examine the man-machine-roadway interaction with respect to braking and stopping a motor vehicle. In the process, students will acquire the concepts and skills basic to precise and well-timed braking.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
4.1	Stopping	Describe the various ways that kinetic energy can be dissapated to stop a moving vehicle.	
4.2	Normal Braking	Indicate the factors that determine braking efficiency in a normal slowdown and stop.	
4.3	Locked Wheel Stop	Contrast locked wheel braking versus normal braking with respect to man-machine-roadway factors.	
4.4	Braking Distance	Given certain speeds and coefficients of friction, predict the effect of these variables on braking distance.	
4.5	Stopping Distance	Given certain speeds and times needed for identifying, predicting, deciding and executing, estimate the total stopping distances. (The purpose here is to implant the idea that the distance is greater than would be expected.)	
4.6	Braking Techniques	Relate principles underlying the braking operation to braking techniques.	
		Culminating Objective: In the driver education vehicle demonstrate sound judgment and proper technique in braking under normal circumstances. In addition, demonstrate the capability to make a *sudden* stop.	

CONTENT

4.0 When speed is constant, braking time and distance vary with the brake performance, tires, road surface, and braking technique of the driver.

4.1 In order to stop a moving vehicle (a body in motion tends to remain in motion), friction must convert kinetic energy into heat.

a. On a level road with foot off the accelerator the car will eventually roll to a stop without braking because the rolling friction between tires and road surface, the friction of the moving parts, air resistance and the engine compression all help to slow down the vehicle. The car will stop in a shorter distance going uphill, and conversely downhill, because of the additional force of gravity.

b. In a normal braking stop it is the frictional drag of the brake lining against the brake drums that slows the revolving wheels, and the tires transmit the braking force to the road surface.

c. In a locked wheel stop, energy is dissipated through heat generated between the sliding tires and the road surface.

d. In a collision, energy is dissipated by crushing and bending the metal of the vehicle, or resistance from the obstacle that it hits.

4.2 Braking efficiency is influenced by a number of factors.

a. Wear, grease and water reduce the efficiency of the brake lining and drum contact points.

b. Liquids cannot be compressed, therefore, hydraulic fluid in brake lines running from a master cylinder to each wheel cylinder transmits pressure as effectively as a steel bar, assuming high quality brake fluid and a tight system.

c. If all four wheels are *not* braking equally, braking distance for a given speed will increase and steering will be unpredictable.

d. The front wheels are required to do more work than the rear wheels because of weight transfer.

e. Power brakes assist the driver in applying brake pressure but do not affect the amount of friction or braking force generated.

f. The coefficient of friction between the tires and the road surface governs the maximum braking force usable. The most powerful brakes are useless without traction.

g. Maximum braking force is obtained just before the wheels lock.

4.3 When brakes are applied too firmly or too suddenly the friction between the brake lining and the brake drum is so much greater than the friction between the tires and the road surface that the wheels stop or lock before the vehicle stops.

a. If the wheels lock, the friction between the tires and the road is the major determinant of the length of the stop.

b. The lower the coefficient of friction between the tires and the roadway the less effort required to lock the wheels.

c. In a locked wheel stop, heat generated between the tires and the road surface tend to melt tire rubber or ice thus reducing further the coefficient of friction.

d. When the wheels are locked equally the vehicle will usually slide straight ahead unless acted upon by some other force, i.e., the wind, side slope or crowned road, curve or surface variation.

e. When the rear wheels lock while the front wheels run freely, the vehicle will be prone to turn completely around, (180°) if speed is sufficient. If not carefully controlled, applying the parking brake too forcefully in an emergency could produce the same result.

f. Locked wheel braking in effect takes away your steering control.

(1) Rolling friction between tires and roadway is essential before the direction of the vehicle can be changed by the use of the steering mechanism.

(2) Although steering control is lost in a locked wheel stop, braking distance may not be significantly different, in fact it may be shorter.

4.4 Since kinetic energy, which must be changed to heat by braking, varies in a geometric progression, so does braking distance. (Double the speed, and braking distance increases four times; triple the speed, and braking distance increases nine times.)

a. Although this assumes a locked wheel stop, any other braking technique will produce approximately the same distance or longer.

b. When speed remains constant, braking distance varies *inversely* with the coefficient of friction between the tires and the road surface. (When the coefficient of friction is reduced by 1/2, braking distance is doubled.)

c. Weight of the vehicle does not change braking distance significantly in a *locked wheel stop*.

d. A vehicle equipped with bald or threadbare tires will slide considerably farther on a *wet* surface than the same car equipped with tires having good tread. A driver can be lulled into a false sense of security because of the relatively good stopping ability of bald tires on a dry surface.

4.5 Total stopping distance equals the distance a vehicle travels during the time needed by the operator for identification, prediction, decision and execution, plus the time required for the brakes to stop the vehicle after the brake control has been activated.

a. Feet per second serve as a basis for determining distance travelled in a given time. To convert miles per hour to feet per second multiply the miles per hour by 1.47.

b. Distance travelled in feet per second during these functions varies directly with the time. Distance equals time multiplied by velocity.

c. Identification, prediction and decision-making time vary widely with the complexity of the circumstances and the capability of the driver. They may vary from a fraction of a second when a red light suddenly appears to a few seconds in a highly discriminative type situation.

d. Execution time varies between individuals due to muscular coordination and skill, and it also varies for the same individual at different times (fatigue, alcohol, drugs, etc.). Covering the brake pedal (foot poised on brake) when uncertain conditions lie ahead reduces execution time if braking becomes necessary.

4.6 Proper technique in braking can provide smooth stops, prevent accidents, and also add miles to the life of the brakes.

a. Braking technique becomes more critical as vehicle speed increases.

b. For efficient braking, foot pressure should conform with the speed so as to use minimum pressure to stop in required distance or time.

c. Releasing the brake pedal slightly just prior to stopping point, permits the vehicle to level and prevents a "snap-back" effect.

d. A slight pumping action of the brake pedal serves to test the proper functioning of brakes, check the traction between the tires and the road surface, and provide a brake light warning to following traffic.

e. When compelled to stop quickly, particularly on a wet or icy surface, intermittant application of the brake pedal (pumping action) will minimize the danger of skidding, and steering control will be maintained. The up-phase permits the tire to roll.

f. When continuous braking is required for a period of time, such as on a long steep downgrade, shifting to a lower gear before starting downwards will provide engine braking power, take some of the strain off brake linings, and help to prevent brake fadeout.

(1) However, some automatic transmissions will *not* downshift above a certain speed.
(2) Light, smooth braking on a long downgrade is often preferred to "pumping," since the up-phase in pumping permits the vehicle to accelerate.

g. Although most of the basic concepts related to braking an automobile (friction, locked wheel braking and braking distance) also apply with slight modification to a two-wheeled vehicle, braking *technique* is different because of the different braking systems in two and four wheel vehicles.

Section – I

Episode Delineation Form

UNIT: A Title: Basic Control Tasks

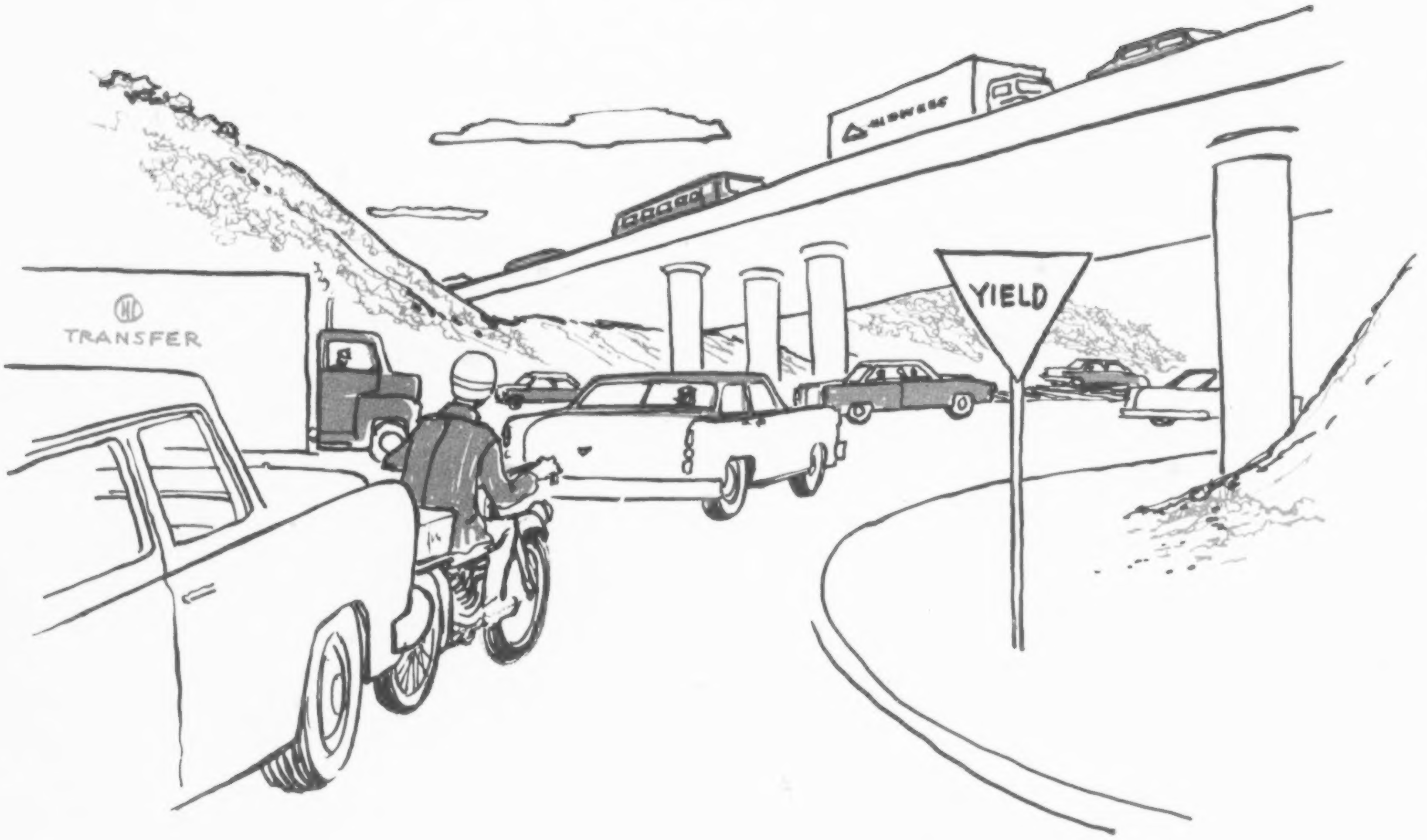
EPISODE 5.0 Title: Maneuvers

EPISODE PURPOSE: To manipulate the vehicle in situations requiring sharp turning movements (particularly in tight quarters), on hills and in other situations requiring precise movements - vehicle operators need to coordinate use of vehicle controls and make skilled and properly timed actions based on sound judgments and decisions. Techniques and underlying concepts required for developing smoothness and precision in these maneuvers is an important part of driver education curriculum. However, since textbooks, lab manuals, films and other sources are well-programmed in this phase, only objectives are included here.

The placement of this episode (last) in the Unit on "Basic Control Tasks", is not intended to imply that it would follow Episodes 1-4. Most of the learning here would occur in the lab portion of the course, so precise placement of "maneuvers" in the curriculum would depend on the coordination of classroom and laboratory instruction.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
5.1	Controls, Gauges and Equipment	5.1-5.9 Students will be able to (1) *verbalize* the proper sequence of steps and related rationale for performing these maneuvers and (2) *execute* the maneuvers to the point where they are able to apply them in light traffic. Further proficiency and confidence will be obtained as they practice the maneuvers under "real-world" traffic conditions (Unit B).	Textbook material, transparencies, films and other aids will help students acquire an understanding of the *how* and *why* of each maneuver. (cognitive learning). This step will reduce the time needed in the lab phase for developing performance proficiency. Lab methods appear to have distinctive strengths related to developing proficiency in performing maneuvers. *Simulators* - A good method for learning the *sequence* of steps. Can help also in the "identify", "predict" and "decide" functions as they relate to the maneuver. *Multiple Car* - Efficient and effective method for learning the motor skills and distance judgment required for executing the maneuvers. *Traditional In-Car Method* - Brings together all the capabilities needed to perform the maneuvers-understanding, motor skills, perceptual and predictive capability.
5.2	Pre-starting and Starting Procedures		
5.3	Starting, Moving, Stopping and Security		
5.4	Left and Right Turns*		
5.5	Backing		
5.6	Turning the Car Around		
5.7	Lane Changing and Passing*		
5.8	Parking-Angle, Perpendicular and Parallel		
5.9	Up-down Hill Starting, Stopping and Parking		

*Concepts and generalizations related to these and some of the other maneuvers are included in the next unit-"Interacting With Other Highway Users"



SECTION I – ON HIGHWAY TASKS

Unit B – Interacting With Other Highway Users

Unit Objective:

Students will be able to demonstrate a level of proficiency in the human functions (identification, prediction, decision and execution) sufficient to perform legally and safely as they interact with other highway users in routine and difficult system environments.

Episode Titles:

1.0 Human Functions and Motor Vehicle Operation

2.0 Impediments to Vision

3.0 Distractions

4.0 Movement Within Traffic Flow

5.0 Intersections

6.0 Pedestrians and Animals

Episode Delineation Form

UNIT B Title: Interacting With Other Highway Users
EPISODE 1.0 Title: Human Functions And Motor Vehicle Operation

EPISODE PURPOSE: Human functions, mental as well as physical, are involved in performing the many tasks and sub-tasks of driving. Regardless of whether the operator is negotiating a curve, passing another vehicle, or parking, he must read the traffic scene, make predictions and decisions, and implement his decision. Competency depends upon the operator's proficiency in performing these functions.

In this episode students will acquire a mental picture of the functions (identify, predict, decide, execute) as they relate to the driving task. This background is important because the functions will serve as fundamantal concepts, connecting points, and goals for the curriculum. Each episode will relate and contribute to developing student proficiency in one or more of the functions.

In teaching the functions of driving, it must be emphasized that they interrelate and interact and are separated here only for analysis purposes. Furthermore, the functions are not necessarily performed consciously, in fact, they rarely are.

Refer to Fig. 4, page 10, for a graphic illustration of these concepts.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
1.1	Identify	Write a description of the human functions involved in operating a motor vehicle. Include essential elements in a correct and related sequence.	To initiate this episode the teacher asks "What abilities other than motor skills are needed to drive?" Through responses to this and followup questions the class begins to form a picture of the functions needed to operate a motor vehicle. The teacher then fills in with whatever detail he feels is appropriate at this stage, using printed materials and visuals to facilitate meaningful learning. If large cards with the functions printed on them are placed permanently in the classroom for all to see, they will serve as a frame for each lesson.
1.2	Predict		
1.3	Decide		
1.4	Execute		

CONTENT

1.0 In operating a motor vehicle man functions as a sensor, an information processor and a controller.

1.1 One of the basic operator functions in the driving task is to acquire and maintain a clear, complete and accurate picture of the traffic scene in order to *identify* any critical objects or changes which may require compensatory actions.

a. A person is somewhat like a computer with numerous inputs or channels of information flowing in through the sensory equipment.

b. Vision is the primary medium through which the operator acquires environmental and vehicular information.

   (1) Visual observations are limited by the physical abilities of the eyes to see clearly (acuity), judge depth and distance, distinguish colors, see in low illumination and adapt to glare.
   (2) Central vision consists of a relatively small angle and focuses on only one thing at a time, but fringe vision, which is much wider, enables the driver to observe important cues in the upper, lower and side range of vision.
   (3) The eyes can focus on only one thing at a time, but can move very rapidly between several stimuli.
   (4) Actual reading or observing of events is accomplished during the fractional seconds when the eyes fixate.

c. For optimum information acquisition, the operator needs to use a consistent, systematic and aggressive search pattern.

   (1) The search pattern should continuously scan roadway location and characteristics, location, movement and movement potential of other highway users; traffic control signs and signals; near roadway fixed objects; and the vehicle's instrument panel.
   (2) Although an effective search pattern encompasses the total traffic scene (front, back and sides), it concentrates on the various sectors in proportion to the likelihood of hazards.
   (3) A scanning pattern employing the "brief glance" technique enables operators to maintain continuous awareness of their relationship to conditions ahead, and, at the same time, acquire a picture of conditions elsewhere that could affect his decisions.
   (4) In addition to looking for environmental cues, the driver needs to monitor the location, movement and functioning of his own vehicle in the environment.
   (5) The best search rate and pattern may not be intuitively obvious to the operator, so he needs to learn proper visual habits. (Research needed here.)

d. The operator's ability to maintain a search pattern which detects important cues, without distortions or illusions, is influenced by:

   (1) the position, intensity, color, contrast and movement of the stimuli;
   (2) the condition of his sensory equipment, particularly the visual apparatus; and
   (3) distractions outside the vehicle, inside the vehicle and within the person.

e. Besides visually acquired information, the operator senses important cues through auditory, tactile, kinesthetic and other sensory mechanisms.

   (1) The operator should have a sense of "road feel" of what the car is doing through every physical contact–the seat, floor, brakes and steering wheel.
   (2) Auditory cues can help the operator to evaluate his vehicle's performance, and also to sense adjustments needed in relating to other highway users and the environment.

f. From our eyes or other sensory equipment the messages go to the brain, where they are translated into meaningful information through a sorting and analyzing process commonly referred to as perception.

   (1) Because of physical and psychological factors the brain does not attend to most things we see, but instead selects only those incoming sensations it wants to consider.
   (2) Which stimuli are selected and identified depends upon (a) the degree of threat, (b) previous experience and learning, and (c) motives and emotions in play at the time.
   (3) As the number of elements (cues) to be identified increases, the chance of missing an important cue increases. Each element tends to distract the operator from any other element.
   (4) Sometimes relevant information will be ignored because of an information overload, while on the other hand, an information underload tends to cause the operator to disassociate himself from the task (limited access highways).

(5) Failure to identify cues correctly, or too slow an identification, can break the operational chain for selecting a safe field of travel.

g. Operators predict, decide and act, not according to what things are really like, but according to their perception of what they are like. If your driving actions are to lead to the results that you expect, your perceptions must correspond closely to reality.

(1) Our eyes and brain do not merely register some objective portrait of objects, events and people, but the act of seeing is warped by what we want and, in a sense, need to see.
(2) Before sensory impulses reach the reasoning center of the brain (cerebrum), they take on the emotional characteristics of our values, motives and personal needs.
(3) We see what our past experiences and associations have conditioned us to perceive. People act so differently because different things happened to them in infancy, childhood and adolescense.

1.2 After operators identify the position of important elements (cues) in the traffic scene and their relationship to each other, they must project and *predict* possible future relationships and outcomes, constantly hypothesizing about what will or might be.

a. The operator must compare and correlate what he has identified regarding man-machine-environment relationships affecting his progress, with his stored knowledge and insights related to:

(1) traffic laws and controls;
(2) physical forces;
(3) human characteristics and driving norms;
(4) vehicle dynamics; and
(5) other concepts related to roadway and traffic conditions.

b. A crucial and somewhat difficult function for the operator is to judge time-space relationships between his vehicle and other elements in the system, both fixed and moving.

(1) It is especially difficult to judge closing rate and oncoming vehicle speed.
(2) The operator's proficiency in making time-distance judgments on dynamic (moving) elements depends on fixation time as well as experience in making similar judgments.
(3) As the speed of the operator's vehicle or other vehicles around him increases, judgments of time, space and speed become more difficult to make.

c. In a non-social driving situation (no other highway users nearby), the accuracy of the operator's predictions depend mostly upon his understanding of and "feel" for the physical principles involved in the man-machine-environmental relationship (friction, inertia, gravity, braking distance, etc.).

d. The traffic situation is predominantly a social situation (must use the highway *with* other users), therefore, the operator needs to predict the probability of other highway users occupying his path at the same period of time.

(1) Predictions related to other highway users are more subjective and unpredictable than those related to physical elements in the environment. You do not know what the other driver will do but you should consider what he might do.
(2) We know very little about the physical, mental and emotional state of highway users with whom we interact. Although efforts are being made to identify and "ground" the unfit until their impairing condition has been cured or properly controlled, there are operators on today's highways afflicted by serious physical and mental disorders.
(3) Expecting and being prepared for the unexpected or the worst behavior on the part of others usually will afford you the time and space to take evasive action. It is better to assume the worst and not have it happen than to ignore the worst and have it occur.
(4) Deviant action by other operators does not necessarily imply anti-social motivation, they simply may have misperceived the situation. Surveys show that most persons driving with their headlights on high beam at inappropriate times are doing so *unintentionally*.
(5) The validity of predictions and expectations increases in relation to an increase in the accuracy and adequacy of communications occurring between highway users through such means as directional signals, brake and back-up lights, position of vehicle, horn, speed changes, body lean of vehicle and eye-to-eye contact.
(6) In addition to the usual cues related to the other operators' intentions, sometimes the age, number of people, and actions of the drivers or passengers in the other vehicle will reveal some valuable tips as to what we might expect.
(7) Quality of predictions can be increased if the operator considers not only how the situations appear to him, but also takes into consideration how the situations appear to other users around him and what his behavior means for other users.

(8) In predicting the actions of other highway users, the operator is aided by a set of rules and norms which serve to coordinate the interaction of highway users by limiting path speed alternatives (lane markings, signs and signals, right-of-way laws and speed controls).

(9) While a prudent operator will be guided by expectations concerning the behavior of other highway users, he *avoids full commitment* to assumptions about what they will do. He is prepared to adjust in case his prediction is not borne out.

e. In predicting the potential movement of other vehicles, an operator should consider the attributes and capabilities associated with each vehicle.

(1) *Motorcycles* can change directions suddenly; difficult to see and to judge their speed (one should imagine the motorbike is moving faster than it seems to be); unstable compared to four-wheel vehicle; more susceptible to loss of control; operator has excellent forward vision but rear view mirrors may be ineffectual; reaction time of the operator is less since hands and feet are placed on the controls; operator may be less attentive to the driving task since the nature of the vehicle is sporty.

(2) *Trucks and buses* require more space to manipulate; tend to slow down going up a steep incline, but pick up speed going downgrade; require more time to pass another vehicle going in the same direction; create visibility problems for other operators; drivers usually performing under a time schedule; truck drivers are typically skillful, helpful and courteous.

(3) *Compacts and sport cars* are influenced greatly by winds; difficult to see in "blind spots" and dips in the road; harder for other drivers to judge their speed and distance; turning radius less; design features create a larger blind spot for their operators; deviation from given path may be more abrupt; difficult to predict their acceleration capabilities because of big differences in motor size and compression rates.

(4) *Others*–bicycles; emergency vehicles; entertainment oriented vehicles; farm vehicles; horse drawn vehicles; and snowmobiles.

f. Any traffic situation containing several threatening elements presents a prediction problem for the operator that is greater than the sum of the separate problems posed by the individual elements (synergetic effect).

(1) Seldom are there any loose, isolated elements in the traffic scene, since the changing of one element usually changes the meaning of another. A dog on the shoulder of the road in front of us is mutually related to the oncoming vehicle and the traffic in back of us.

(2) Multiple elements increase the probability that the "worst" will occur. The fact that more possibilities *can* occur increases the chance that something will occur.

(3) Multiple hazards usually create a situation in which solutions conflict with one another (giving an animal on the shoulder a wide berth increases the threat from an oncoming vehicle).

1.3 Formulating a course of action with intent to execute it makes up the *decision-making* function in operating a motor vehicle. Operators make predictions on the basis of their perceptions, and then make decisions on the basis of their predictions.

a. The uncertainty, unpredictability and complexity of the traffic environment generate for the operator many and varied decision problems ranging from minor automatic to highly complex decisions. The simple and routine decisions need to become habitualized, allowing the higher center of brain activity additional time for more difficult or complex decisions.

b. Decision time increases as the number of choices increases, due to the additional burden of sorting and analyzing the sensory data. Difficulty of the decision also increases the time that the driver must have to carry out the decision.

c. Most of the decisions in driving relate to anticipating the threats from the traffic environment and other highway users, and then adjusting to those threats by proper position (allowing a space cushion) and speed.

(1) By decreasing speed and/or increasing the distance from hazards, the operator can buy more time for the eyes to see and the brain to identify, predict and decide upon a wise course of action.

(2) Speed relative to the speed of other vehicles is as important as your own speed in miles per hours. When you are out of tempo with other traffic, too fast or too slow, passing and other situations are created which disturb traffic flow and create hazards.

(3) In situations of limited space–intersections, merging, passing, parking lots–speed control

is the only means available to avoid conflict with other highway users.

(4) Since man is a poor detector of relative velocity between himself and other cars (especially at night), he should allow a margin of error through increased distance and reduced speed.

(5) Good positioning of your vehicle provides ample sight distance for efficient tracking and full viewing and, in addition, affords adequate time and space for unhurried decisions and judgments.

d. Because of the compounding effect of multiple elements in the traffic scene (referred to in 1.2 - f.), operators will benefit from decisions that reduce the number of elements they must contend with simultaneously.

(1) *Where* operators meet moving vehicles, pedestrians and animals, can be controlled by speed adjustment. (Adjust speed to avoid meeting an oncoming vehicle at any other hazard, for example, an animal along the highway.)
(2) Usually operators can determine *where* they will execute maneuvers—backing, parking, turning around, lane changing and passing. Avoid these maneuvers in combination with any dangerous highway or traffic conditions.
(3) Drivers should adjust the heater, light a cigarette, converse with passengers and other non-operational tasks only where the vehicle is under their control, and only when traffic conditions are relatively free of hazardous elements.
(4) Weather, road design and condition, and other factors not under the control of the operator make it especially important that the operator use the means at his disposal to avoid multiple dangers.
(5) Pre-trip decisions can reduce many possible combinations of dangerous elements (destination clear, congested areas avoided, children entertained, driver and vehicle fit, etc.).
(6) Whatever compromise might have to be made in facing multiple hazards, operators should decide upon a course of action that minimizes the *probability* of conflict with another highway user.

e. No one is authorized to take the right of way if to do so would cause a threat to life or property.

(1) Right-of-way laws spell out which highway user is to take precedent or is favored over another in situations of potential conflict. Usually, the law places the emphasis on which driver shall "yield."
(2) One should never take right-of-way privileges until he is sure other drivers are yielding, regardless of the other person's faulty driving or unobservance of the law. Right-of-way is something given to you by another highway user, and if he does *not* grant you the right-of-way then you do not have it.
(3) Even if you do have the right-of-way, you still can be held responsible for an accident (contributory negligence) if you have the "last-clear chance" to avoid the collision but didn't take it. An analysis of two-car collisions reveals that in most cases, particularly at intersections, both drivers contributed to the event.
(4) Being legally right does not spare the suffering or inconvenience of an accident caused by another person's faulty or illegal driving.
(5) Errors on the part of one operator may be compensated for by mature judgment and skill upon the part of other drivers in almost every situation.

f. Speed and quality of decision-making varies from person to person, depending largely on the individual's previous experience and familiarity with the situation that demands the decision. Young drivers can hasten the development of decision-making capabilities by:

(1) improving their information gathering and predictive capability;
(2) learning the principal response alternatives available to drivers;
(3) identifying the mental errors drivers should guard against; and
(4) analyzing driving situations that produce problems.

1.4 The sensory and mental functions (identification, prediction, decision) finally culminate in the performance function as the operator *executes* his decisions related to direction, speed and communication with other highway users. Failure in execution is a failure to do what was intended and is not a mistake in decision.

a. As the driving scene changes, the operator tries to compensate for or match these changes by a series of properly timed, semi-automatic, physical responses to the stimuli from the traffic environment. The more you drive the more habitual these responses become.

b. The operator's success in making the vehicle do what he wants it to do depends on the speed and preciseness of his skill in:

(1) manipulating controls for regulation of power and velocity;
(2) manipulating steering wheel for guidance of the vehicle;
(3) manipulation of controls for slowing and stopping; and
(4) manipulation of controls and other actions for communicating and signalling.

c. Learning to manipulate the controls in a prescribed sequence facilitates habit formation and thus helps to assure safe and efficient performance.

d. Motor responses are relatively simple, easily mastered, and relatively invariant, once the operator is familiar with the vehicle and knows the relationship between his control inputs and the vehicle output.

e. The operator controls the movement of his vehicle in both lateral and longitudinal dimensions of the environmental space.

(1) The steering mechanism represents the primary vehicle mechanism for lateral control and thus vehicle path.
(2) The accelerator and brake are the primary mechanisms for longitudinal control.
(3) Lateral and longitudinal control relate, particularly at higher velocities, when inertia forces limit the safe turning angle.

f. Two performance measures which reflect the speed and precision with which the driver used the controls are number of speed changes over time, and number of direction changes over time.

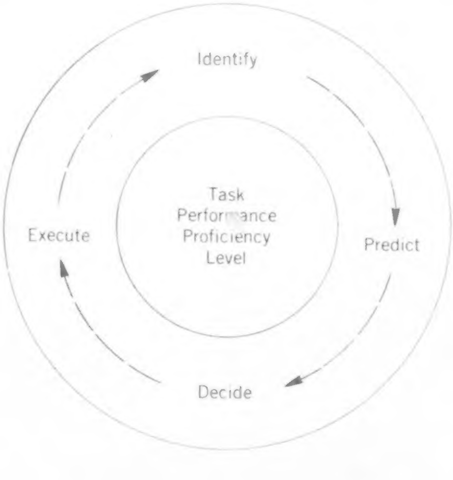
g. Differences in over-all response time (time from identification through execution) are due mostly to the speed and quality of the information processing and decision function rather than differences in simple reaction time.

h. The competent operator rarely has to depend on his reaction time per se (time between decision and execution) to avoid a conflict, because he has already anticipated and compensated for the impending threat.

i. When a stimulus of a dangerous situation is sufficiently violent, operators will break down and allow a reflex or impulsive action to take over or they may "freeze" (information processing function is by-passed).

j. The consequences of all control actions are invariably made known to the operator by comparing his neuro-muscular responses and "feel" with the resulting changes in location and speed.

(1) Feedback is a very important, if not dominant means of identifying the compensatory changes in the vehicle's direction and speed needed to achieve an optimal state in the traffic scene.
(2) When feedback is eliminated or restricted under conditions of fog, snow or darkness, driving becomes extremely difficult and dangerous.
(3) To the experienced and competent operator, the vehicle becomes, in a sense, an extension of his body, as with any instrument that one uses. (When we draw a line in the sand with the end of a stick, our feeling is transferred to the end of the stick.)



Episode Delineation Form

UNIT B Title: Interacting With Other Highway Users

EPISODE 2.0 Title: Impediments To Vision

EPISODE PURPOSE: Impediments (interferences) to vision are one of the worst handicaps to the successful performance of the driving task. Certainly, before a driver can identify, predict, decide and act upon a stimulus, the stimulus must be observed.

In this episode vision problems will be organized into meaningful "clusters," for the purpose of increasing the students' recognition and adjustment capability. Special emphasis will be placed on the implications these visual handicaps have for positions and speed selection.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
2.1	Clean Windshield and Windows	Group the impediments to vision caused by dirty or foggy car windows, and describe measures under the driver's control to prevent or compensate for these conditions.	
2.2	View Obstructions	Given a series of traffic situations (slides or diagrams), "spot" the obstruction and select appropriate measures to compensate for the situation.	
2.3	Climatic Conditions	Illustrate the similarity of various climatic conditions and darkness with respect to vision problems.	
2.4	Nighttime Condition	Classify the visual handicaps imposed by darkness, and describe compensatory measures at the operator's disposal.	
		Culminating Objective: In the driver education car, cope with vision handicaps imposed by view obstructions and darkness with minimum error.	

CONTENT

2.0 Although impediments to vision handicap the operator under any circumstances, they are especially hazardous where he interacts with other highway users.

2.1 If drivers fail to maintain clean windshields and car windows, both inside and outside, they limit their ability to identify relevant cues in the traffic scene.

a. A clean windshield is important any time, but critical at night.

(1) With a clean windshield approaching lights are easier to face. Dirt and road film diffuse approaching headlights.
(2) A bug which is only a speck by day becomes a glaring spot at night.
(3) When the windshield is dirty so are the headlights.

b. Windshield wipers and washers help to maintain good forward visibility in spite of weather conditions.

(1) If windshield wipers begin to "streak," they may be covered with road film, so clean the blades with water and detergent.
(2) If they continue to streak, the rubber blade has probably deteriorated, in which case it should be replaced.
(3) If new blades fail to improve the situation have tension or pressure of the blade checked.
(4) Wipers should be stopped when rain or snow stops to avoid scratches which eventually reduce the transparency of the glass. This can occur also from using a dry cloth to clean dirty windshields.
(5) Keep the windshield washer in good repair and filled with water and windshield cleaner. (Helps to remove dirt and bugs from the glass and in winter protects the washer parts from freezing.)

c. Inside surfaces of windows may fog, winter or summer.

(1) Use defroster rather than cloth or tissue.
(2) Blower air needs to be heated in winter.
(3) Sudden fogging or icing may require the driver to get off the roadway as quickly and safely as possible.

d. Visibility to the sides and rear of the vehicle enables the driver to detect cues helpful in selecting a safe path and speed.

(1) Failure to remove snow, ice or frost from not only the windshield, but all windows, is *negligence.*
(2) Cigarette smoke and dust cling to the inside glass and gradually reduce vision with deceptive slowness.

2.2 View obstructions are "occupational hazards" in driving, but the unnecessary ones should be eliminated and the others adjusted for by the vehicle operator.

a. The size of a view obstruction caused by vehicle design, a sticker on the car window, or an item within the vehicle is enlarged many times over at a distance from the vehicle. (To illustrate, hold your hand at arm's length and notice the size of the area blocked out at 100 feet.)

b. Operators can reduce the view obstruction hazard caused by parked and moving vehicles by adjusting their space relationship to the other vehicles.

(1) Trucks are a problem because you cannot see through them to identify other traffic.
(2) In rain, trucks throw a spray of water that interferes with vision in a passing maneuver.

c. Operators can reduce the problem of barriers to sight such as a building, a blind corner or a parked car by expecting potential hazards behind the barriers. (Unfortunately, for some operators potential hazards do not have the potency of visible hazards and they play Russian Roulette.)

d. In addition to interfering with the driver's movements, a passenger sitting in the front middle seat may obscure the driver's vision to the rear through the rear view mirror, or obstruct the driver's check of the blind spot on his right. (Better to sit three in back than three in front.)

e. One of the most practical and least costly measures to improve the operator's visibility is to eliminate signs, bushes, trees, poles and cars parked near intersections.

2.3 Weather conditions may reduce visibility thereby adding the limitations of night driving to a daytime situation or compound the normal visibility problems associated with nighttime driving.

a. Rain, particularly at night, can distort vision as the wet surfaces reflect all the lights creating a maze for you to drive through.

b. Aside from helping the oncoming operator to see you, switching your lights on in a heavy rain also helps the driver directly ahead whose back window is rain splattered. An unlighted vehicle is difficult to detect in a mirror during a heavy daytime rain.

c. Low beam headlights are more effective in fog (rain and snow also) because fog is made up of tiny particles of water that act like mirrors to reflect high beam lights. In *light* fog, high beams may show more of the roadway in spite of the glare.

d. The face shield used by the two-wheeled vehicle operator will impede vision when wet, and it will fog up in cool weather when the vehicle is not in motion.

e. In fog, heavy rain or snow, and other times when visibility is extremely poor, drive slowly, hug the side of the road and glance frequently at the edge of the road to keep your bearings.

f. The sun can be a particular hazard because the eye adapts slowly to changes in light intensity.

(1) When facing the blinding effects of the sun—early morning and late afternoon—a driver can improve his vision by (a) keeping the windshield clean, (b) properly positioning the sun visor(s), and (c) wearing sunglasses.
(2) If you are driving away from the sun, do not assume the oncoming operators can see you; they may be blinded by the sun. (Turn on your headlights.)
(3) After hours of driving in the bright sunlight, your visual efficiency is reduced at dusk and in darkness.

2.4 Due primarily to reduced visibility, critical phases of the operator's task are more difficult under nighttime driving conditions and the competent operator adjusts for these differences.

a. The flood of detail available to help the operator during the daytime is reduced appreciably at night.

(1) Aside from reducing detail, darkness *conceals* hazards (the pedestrian, the two-wheeled vehicle, the stalled car, the curve and other objects or conditions), hence, the operator makes a decision on the basis of a sketchy and incomplete picture.
(2) It is more difficult to judge the speed and position of another vehicle at night.
(3) Operators must depend largely on their headlights which illuminate only a relatively short and narrow path ahead, and do not bend around corners.
(4) The amount of adequate highway lighting is limited.
(5) Glare from roadside lighting and the headlights of oncoming vehicles impair visibility.

b. To compensate for the handicaps imposed by darkness:

(1) keep panel lights dim for better vision, but always have enough panel light to read the speedometer;
(2) reduce stopping distance by slowing down, so that you can stop within the visible distance;
(3) increase sight distance by keeping the headlights clean and properly aimed and the windshield clean;
(4) watch beyond the headlights on or near the roadway for slow moving or unlighted vehicles, curves and T intersections, road obstructions or defects, trains, pedestrians and animals;
(5) avoid looking directly into glaring headlights of oncoming vehicles;
(6) increase your following distance;
(7) allow a greater margin of safety when overtaking and passing;
(8) be especially careful to observe and obey fully all rules of the road and all traffic signs and signals;
(9) do not wear sunglasses or tinted face shields (motorcycle operators) at night; and
(10) keep face shield clean and free of scratches which will increase glare at night.

c. When visibility is reduced by darkness or weather conditions, other operators are similarly hampered.

(1) Clear and timely signalling of your intention to slow, stop or turn is more important than ever at night.
(2) Be sure that taillights, back-up lights, license plate lights, and turn signals are functioning.
(3) Turn your low-beam headlights on at dusk, and during the day-time periods of low visibility, not that you will see much better, but other operators will be able to see you (particularly important for two-wheeled vehicle operators).
(4) Use low-beam headlights when an oncoming vehicle is approaching, regardless of what the other driver does; and also when following or passing another vehicle. A quick flash of high beam may be used to indicate a pass.
(5) If for some reason you must stop along the highway, pull well off the traveled portion and actuate a 4-way flasher.

Episode Delineation Form

UNIT B Title: Interacting With Other Highway Users

EPISODE 3.0 Title: Distractions

EPISODE PURPOSE: Distractions appear to be another common and serious threat to successful performance of operator task requirements. The driving environment, both inside and outside the vehicle, is full of distracting influences which the drivers must ignore or adjust to. This episode aims at helping students to identify these distracting influences and develop mental habits to prevent them from interfering with effective driving performance.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
3.1	Environmental Distractions	Classify potentially distracting environmental factors, predict the possible consequences, and formulate compensatory measures.	
3.2	Within Vehicle Distractions	Classify potentially distracting within vehicle (non-passenger) distractions, and suggest personal means for reducing or eliminating the hazard created by these conditions.	
3.3	Passengers	Describe the ways in which a passenger can be either an asset or a liability to the operator.	
		Culminating Objectives: In the driver education car, during regular lessons, demonstrate ability to concentrate on the driving task despite distracting influences outside and inside the vehicle (or problems brought with them). In the driver education vehicle, manipulate the various control devices (windshield wiper and washer, radio, heater and air conditioner and lights) while maintaining adequate attention on the driving task. Furthermore, when a rear view mirror is bumped out of line, or a door is not closed properly (planned by the teacher) the student stops the vehicle at the first good opportunity and corrects the situation.	

CONTENT

3.0 Inability to sustain vigilant attention over long periods of time is a human limitation for which operators must compensate.

3.1 Environmental and vehicular factors can encourage the operator to disassociate himself (mentally) from the driving task.

a. Although modern highways and vehicles have been engineered and built to provide safety and comfort, the very nature of this combination can lull you into an inattentive state of mind.

   (1) Highway designers are cognizant of this reality and are building more stimuli and variation into the highways.
   (2) Long-haul driving may induce lack of awareness (a dull drowsiness) by the drone of the engine, the hum of the tires, an absence of scenic distraction, a fixed eye position and a lack of physical mobility.

b. Frequently where the need for attention by the operator is most urgent, the distractions outside the vehicle are the most numerous. In cities particularly, the operator must disregard a barrage of distractions, many deliberately designed to attract attention.

c. The danger of inattention in driving can be minimized by:

   (1) realizing when and where gaps in attention and distractions are most likely to occur, and developing mental habits and discipline that reduce the number and duration of these gaps;
   (2) developing good operational habits to "carry" us through the lapses.

3.2 Certain physical actions by the driver, some unrelated to the actual driving task, must either be avoided or accomplished without interfering with vehicular control.

a. Be sure that doors, seats, mirrors, windows and seat belts are properly secured and adjusted before moving the vehicle.

b. In case you have an operational problem while underway (door unlatched, outside mirror adjustment, bee in the vehicle), it is safer to get off the highway and correct the problem.

c. Avoid reaching for papers, books, purses, bottles, etc. that have fallen on the floor until you have stopped the car.

d. Learn to adjust the heater, air conditioner, radio, windshield wipers, inside rear view mirror, and front window (driver's side) without taking your eyes off the road, or, if you do, use brief glances.

e. Although the throttle, front brake, clutch, carburetor, headlight and mirror of a two-wheeled vehicle may easily be adjusted while riding, it may be quite hazardous to do so.

3.3 Passengers can be either an asset or a liability to the driver.

a. Passengers can serve as "navigators" by looking for destination or turn-off points, reading maps and giving directions, and tactfully spotting any cues that will aid the driver.

b. Passengers can help the driver by handling non-operational tasks, such as temperature control, radio adjustment, child control and other activities that might distract the driver.

c. Passengers should refrain from irrelevant (to the driving task) conversation at the times when the driver needs his full capability of perception and decision-making.

d. Passengers can be held liable for offenses that contribute to an accident.

e. As a driver, if you talk with passengers, it is better to do so without looking at them.

f. The passenger of a two-wheeled vehicle can affect steering and stability through his body position and movements.

Episode Delineation Form

UNIT B Title: Interacting With Other Highway Users

EPISODE 4.0 Title: Movement Within Traffic Flow

EPISODE PURPOSE: This episode relates the human functions involved in operating a motor vehicle to specific "fore and aft" relationships with other highway users. Emphasis will be placed on strategy to avoid conflict or turbulence within the traffic flow, but evasive actions will also be learned.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
4.1	Following Preceding Vehicle(s)	Given a series of traffic situations involving "fore and aft" relationships, identify relevant cues and select measures under operator control that will reduce the probability of conflict with other highway users. These situations will include freeway approach ramps and acceleration and deceleration lanes.	
4.2	Being Followed by Another Vehicle		
4.3	Meeting an Oncoming Vehicle		
4.4	Passing and Being Passed	Describe the correct step-by-step process for passing another vehicle going in the same direction. Description should include the rationale for each step.	
		Culminating Objectives: In the driver education vehicle: 1. Over a prescribed course demonstrate the judgment and skill needed to select appropriate position-speed alternatives in relating to vehicles within the traffic flow (front, back, oncoming). 2. Demonstrate the proper means of entering and leaving (a) parking lanes and (b) acceleration and deceleration lanes on a four-lane highway. 3. On a two-lane highway, demonstrate the judgment and skill essential for making a safe pass of another moving vehicle.	

CONTENT

4.0 Except at intersections and merging locations the operator's sub-tasks of interacting with other highway users relate mostly to vehicles in front and in back of his vehicle.

4.1 To be prepared for unexpected moves by the vehicle(s) in front of you, maintain proper following distance and watch for conditions which would cause the driver to slow or stop.

a. So that you can adjust for fluctuations in the speed of traffic ahead without sharp braking or acceleration, allow your reaction time distance plus a *generous* margin of safety.

(1) Your braking distance may exceed the braking distance of the vehicle in front.
(2) If the preceeding vehicle hits something it may stop far short of the braking distance.
(3) Lightweight motorbikes may be stopped in a shorter distance than an automobile below 25-30 mph, so increase following distance. In addition, motorbikes and motorcycles can topple during an emergency stop or from striking an object on the roadway.

b. It is wise to allow a much wider margin of safety when you are traveling at high speed, at night and on slippery surfaces.

(1) On freeways there is virtually no such thing as a "minor" rear end collision.
(2) Braking distance is more unpredictable on slippery surfaces.
(3) It is more difficult at night to detect conditions ahead which could cause preceding vehicles to reduce speed suddenly.

c. By driving too closely to the vehicle in front:

(1) you must work harder to keep your vehicle in its lane, because you are tracking on the vehicle ahead rather than on a point down the road;
(2) your speed control will be erratic as you try to judge and adjust your distance behind the vehicle ahead; and
(3) your view of conditions ahead and to the sides (escape route) is limited.

d. When you maintain a proper following distance you will occasionally encounter the annoying problem of the "compulsive gap-filler."

(1) Simply drop back and re-open a space for your own protection.
(2) You cannot cure the intruder by an emotional outburst or by competing with him.
(3) Actually you will lose little time even though this experience happens a number of times on a given trip.
(4) You can help to preserve a safe gap ahead of your vehicle by making sure that, while adequate, it is not too big or inviting especially in heavy traffic.

e. By being alert and anticipating slow downs or stops ahead, you will rarely need to use all of your space cushion, or resort to a screeching, lurching "panic stop." Some warning clues are:

(1) a traffic light that was green for a long time ("stale green");
(2) a vehicle preparing to turn;
(3) a driver trying to force his way into another lane;
(4) children playing near the road;
(5) a person getting out of a parked car on the street side; and
(6) a street repair job that's causing a bottleneck.

f. At higher speeds there is a tendency to underestimate the rate of closure between your vehicle and the preceeding vehicle (particularly dangerous in the case of a farm vehicle ahead).

g. During freeway driving be prepared to adjust your speed and lane position to assist other vehicles as they enter and leave the freeway. If there are many entrances and exits it may be better to drive in the second lane from the right.

h. By placing your headlights on low beam, you will avoid blinding the driver of the preceding vehicle with your headlights at night. (A law in some states.)

i. If you are driving a motorbike, position your vehicle so that the driver in front can see you in his rear view mirror.

4.2 To some extent you are at the mercy of the driver following you, but there are some measures under your control which can reduce the probability of conflict.

a. Dispose of the "tailgater" by accelerating, decelerating, or moving into a slower lane. (Let him pass!)

b. Be alert to conditions ahead so you can avoid sudden or needless stops.

c. Flash your stoplights by "pumping" the brake pedal and also use a vigorous arm signal to warn an overtaking operator who seems unaware that you are slowing down.

d. When turning off a road do it as quickly as circumstances permit, especially on left turns.

e. Be sure that tail lights, stop lights and turn signals are working properly.

f. Avoid slowing or stopping not required by traffic conditions–to admire scenery, or to check a street address.

  (1) An operator doing 35 mph in a stream of vehicles moving at 60 mph, *relatively*, is driving at 25 mph directly against the flow of traffic in his own lane.
  (2) Again, relatively, he is backing up at that speed and is not even looking in that direction.

g. Signal well in advance of turning and turn from the proper lane.

h. Never stop on the highway–if you miss a turn, continue to the next turn-off.

i. Before changing lanes:

  (1) check the rear view mirrors to see if a safe gap is open, or soon will be open, in the lane where you intend to go;
  (2) use turn signal and give the operators concerned with your turn time to perceive the signal;
  (3) take a quick but adequate glance over your shoulder, on the side you intend to turn, to cover the "blind spot," and
  (4) assuming all-clear ahead, move promptly into the desired lane and stabilize your vehicle.

j. Techniques applied on freeway approach ramps and acceleration lanes are similar to those used in lane changing.

  (1) Evaluate the location and speeds of vehicles on the freeway and also any vehicles in front of you on the ramp or acceleration lane. Your rear view mirror will not give you the full picture so you must use short, quick glances over your shoulder.
  (2) Tentatively select a gap in traffic that will permit you to enter the freeway.
  (3) Build up speed to coincide closely with traffic flow.
  (4) Merge smoothly with the outside lane as lane markings and traffic permits.
  (5) Obtain freeway speed as quickly and safely as possible so as not to cause congestion.

k. When preparing to leave a freeway, the traffic to the rear becomes increasingly important.

  (1) Signal early.
  (2) Position your car to the right of your lane.
  (3) Flash your brake lights if traffic is closing in at a high rate of speed.
  (4) Avoid slowing down too much while still on a through lane, but quickly conform to advisory speeds for the ramp.
  (5) If you miss your freeway exit, drive to the next exit regardless of the distance; and if you turn off at the wrong exit return to the freeway at an entrance point. (Never back up!)

4.3 Meeting an oncoming vehicle, particularly on a two-lane road, is potentially the most hazardous situation in driving.

a. An oncoming operator may cross the center line into your intended path as a result of:

  (1) a momentary distraction;
  (2) recovery from a pavement drop-off;
  (3) blinding rain, snow, fog, dust or smoke;
  (4) poor judgment in passing;
  (5) swerving to miss a bicycle rider, a pedestrian, a road defect or obstruction;
  (6) making a turn;
  (7) excessive speed or lack of control on a curve;
  (8) falling asleep; or
  (9) alcohol or drugs.

b. To reduce the risk of meeting an oncoming vehicle:

  (1) keep as far from the center line as practical and on four-lane roads generally use the outside lane;
  (2) constantly check the action of oncoming traffic, so that you will be prepared to take evasive action if someone misjudges and comes into your lane;
  (3) do *not* rely on the approaching car's turn signals;
  (4) reduce speed on older roads and bridges, unless modernized, because these conditions place modern cars dangerously close in passing situations;
  (5) when lights are called for, always use your headlights, not your parking lights;
  (6) at night switch to low-beam headlights and reduce speed on two-lane roads;

(7) flick your lights up and down to signal an oncoming driver that his high beam is blinding, but then use the low beam *whether he does or not.* You cannot improve matters by blinding the other fellow, and besides, you might contribute to an accident;
(8) if other drivers keep signalling their objections to glare from your headlights even when you are on low beam, it probably means that your lights are due for an aiming correction. (A heavy load in the trunk can also raise your lights.);
(9) condition your mind to the possibility of a vehicle coming across the center line into your path by examining the shoulder and adjacent area and planning an escape route (a ditch is better than a head-on collision);
(10) actually practice evasive steering at lower speeds.

c. In the event that an oncoming vehicle does pull into your lane, a head-on collision must be avoided at all costs.

(1) Brake immediately but carefully to avoid wheel lock-up, blast your horn, and dodge to the right—on to the shoulder, into a ditch, or into any gap that you can create in the line of cars on the right.
(2) If necessary, you may have to conflict with vehicles in the right-hand lane to reduce the impact from head-on to sideswiping.

4.4 Safe and efficient passing hinges upon good judgment plus a systematic pattern of action.

a. By staying well back of the vehicle to be passed, the operator is in a better position to:

(1) check the variables ahead which affect his decisions;
(2) accelerate and quickly gain a sufficient superiority of speed when the way is clear; and
(3) stabilize his vehicle in the passing lane before drawing abreast of another car.

b. Pavement markings and signs aid the operator in making a "passing" decision, but he must search for additional information before deciding whether this crucial maneuver is worthwhile, legal, and safe. (When in doubt, don't!)

(1) Grades (vertical curves) on undulating roads were built for cars a foot or two higher, making it difficult to see modern cars in the dips.
(2) The size and color of oncoming vehicles influence the distance judgment of the perceiver.
(3) The operator's view will be obstructed if he follows another car as it passes, and, in addition, there may not be sufficient space for him to return to the right lane.

c. Communicating your intention to pass (horn or lights) reduces the chance that the operator being passed will swerve into your lane.

(1) Avoid passing if the operator ahead is about to pass a pedestrian, cyclist, animal, or anything which could cause him to swerve suddenly.
(2) Also avoid driving alongside in "blind spots" of the other driver longer than necessary.

d. If the operator withholds his final decision to complete the passing maneuver until he is in the passing lane near the vehicle being passed, he will have more time to assess the situation ahead and also be better prepared mentally to brake and pull back into the right lane should an obstacle appear in the path ahead.

(1) Decision is *tentative* until that point.
(2) However, the operator should proceed to the point of final decision as if he were going to complete the pass.

e. If for any reason the vehicle being passed demonstrates erratic behavior before the point of decision is reached, drop back into the right lane and re-evaluate the situation.

f. By building up a clear superiority of speed over the vehicle being passed, the operator minimizes the time he is exposed in the passing lane.

(1) A 15 mph superiority means approximately 8 seconds in the passing lane.
(2) The time required for passing when 15 mph superiority has been built up is the same regardless of the speeds of the two vehicles, *but the distance used up in passing increases as the speed increases.*
(3) Almost one-half mile is needed to make a safe pass at 65 mph if another vehicle is coming from the opposite direction at the same speed.
(4) More time is required to pass a truck, bus or trailer. (Trucks pick up speed on down grades, so you must catch a truck at the beginning of the down grade to pass.)
(5) Because of air resistance and a reduction of power available at the rear wheels, it takes longer to accelerate and pass at high speeds; (a) acceleration power decreases as speed increases—takes longer to accelerate from 60 mph to 70 mph than it does from 50 mph to

60 mph and (b) true of every car, but each car as a variable rate of acceleration.

g. By remaining in the passing lane until the front of the car being passed appears in the rear view mirror, the driver is assured that he can return to the right lane without cutting off the passed vehicle.

   (1) A brief glance over the right shoulder is a good habit to develop, particularly in congested, urban areas.
   (2) Give the operator being passed the following distance that you would like to have.

h. The same key passing rules apply on four-lane undivided highways as on two-lane rural highways except:

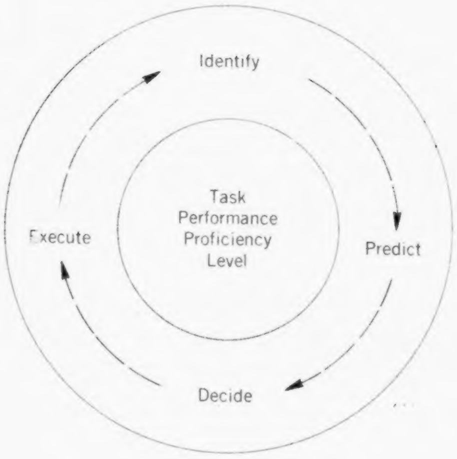
   (1) the passing differential in speed is not as crucial as it is on a two-lane highway;
   (2) instead of judging your pass to reduce exposure in the passing lane, you need a steady speed, flowing and blending with the traffic; and
   (3) passing on the right is permitted. (See state laws.)

i. In a passing situation, if you misjudged the speed and distance of an oncoming car:

   (1) try to brake and fall back in behind the vehicle you intended passing; or
   (2) accelerate and return to your lane ahead of the vehicle you are passing;
   (3) the choice of swerving off to the left should not be considered when an oncoming vehicle is close because that is his best escape route.

j. When being passed maintain an even speed, but if the operator passing you misjudges the distance of an oncoming vehicle you may be compelled either to:

   (1) accelerate and let him drop back into your lane (make certain that this is his intent); or
   (2) decelerate, poise foot on brake, and look for an escape route if needed.



Episode Delineation Form

UNIT B Title: Interacting With Other Highway Users

EPISODE 5.0 Title: Intersections

EPISODE PURPOSE: A large share of traffic accidents occur at places where two or more traffic flows mix, typified by various types of intersections. This is true because of the numerous opportunities for conflict. To avoid conflict and negotiate intersections safely, vehicle operators must apply all of their mental and physical skills, promptly and precisely. To this end, the present episode is directed.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
5.1	Approach	When shown approach positions to various kinds of intersections, identify and appraise relevant cues and state effective means of handling the situations.	
5.2	Turning Movements	Given a series of diagrams or pictures of various kinds of intersections, describe how to execute turning movements. Description should include lane and speed choices, and communication techniques.	
5.3	Railroad Crossings	Explain the mental errors committed by vehicle operators that cause railroad crossing accidents, and how these errors can be overcome. In addition, students will be able to describe the proper steps to follow if their car stalls on railroad tracks.	
		Culminating Objectives: In the driver education vehicle, demonstrate, without a hazardous error, how to negotiate various types of intersections. Situations will include turning movements and going straight through at both controlled and uncontrolled intersections. Students will be evaluated on their ability to "read" the intersection and select appropriate positions and speeds for conditions. Demonstrate with the driver education vehicle the proper steps for crossing a railroad track. Furthermore, in a simulated situation (offstreet area), students demonstrate what they would do if their vehicle stalled on a railroad track.	

CONTENT

5.0 Intersections markedly increase the chances of conflict with other highway users.

5.1 When approaching an intersection, special considerations and checks will facilitate safe and efficient progress for the operator.

a. An intersection is not always defined by signs or traffic signals; for example, factory parking lots and shopping center entrances and exits often create hidden intersections in the middle of the block. Rural intersections may reveal themselves through crossing or turning cars; rows of houses, trees, fences or telephone lines; and signs.

b. An *initial* scanning of the intersection and *traffic to the rear* serves to identify those elements which will affect decisions and present potential hazards. Look for traffic controls, impediments to vision, pedestrians at an approaching intersection, and other characteristics of the intersection.

c. An appropriate approach speed–one that is sufficiently low to permit the driver to stop short of the intersection should conditions warrant such a move–depends largely on the traffic controls, traffic volume and how much sight distance the driver has in relation to the intersecting street.

(1) The shorter the unobstructed view of the crossroad, the lower the safe speed for approaching the intersection. (May necessitate a stop.)
(2) When view is obstructed reduce speed so that the point of decision can be withheld until sight distance is adequate.
(3) A typical "slow down and look" approach to an uncontrolled intersection requires only a few seconds.

d. To negotiate a signalized or signed intersection, operators must apply additional knowledge and skill.

(1) The mere presence of a traffic signal or a sign is a warning of a danger zone, regardless of the color of the light.
(2) Occasionally, you will encounter an operator who attempts to beat the light, or one who simply failed to see the light.
(3) If an operator is stopped for a red signal and it changes to green, he is still required to yield to other vehicles and pedestrians lawfully within the intersection or in adjacent crosswalk at the time such green light is exhibited.
(4) Be extra alert as you approach a "stale green."
(5) "Covering" the brake (foot poised on the brake) as you approach an intersection, minimizes execution time distance should a stop be required.
(6) Watching your speed, the signals well ahead, and other cues will help you to pace yourself with the signal's timing, especially if it is a "progressive" system.
(7) Operators approaching a yield sign shall slow down, or shall stop and yield the right of way to any vehicle in the intersection or approaching on another highway so closely as to constitute an immediate hazard. Continue to brake as at a stop sign until certain there is no need to stop.
(8) Operators approaching a stop sign shall stop and *yield the right of way* to any vehicle which has entered the intersection or which is approaching so closely as to constitute an immediate hazard. A stop sign tells the driver that he must stop, but does not necessarily tell him exactly where to stop.
(9) A flashing red light has the same meaning as a stop sign, a flashing yellow light the same as a "slow" or "caution" sign. (Slow down and be prepared to stop.)
(10) A green light permits the operator to proceed if the way is clear, it does not assure safe passage through the intersection.
(11) When a traffic officer is on duty at a signalized intersection, his directions take precedence over the lights.

e. A careful check to the left, straight ahead, to the right, and left again will furnish the operator with the information needed to make a final decision about passing through the intersection. (Each intersection is different and may require a different search pattern.)

5.2 A competent operator is marked by his ability to make well-timed and accurate turning movements at intersections.

a. A driver communicates his intention to turn by positioning his vehicle in the appropriate lane and flashing his turn signal.

(1) The proper approach lane for an intersection turn, unless otherwise marked, is the one closest to the direction of the turn. This

blocks anyone from trying to pass on the side toward which the driver is turning.

(2) In situations where you suspect an operator following or approaching you does not see your turn flasher because of bright sunlight or inattention, use an arm signal, also.

(3) If turn signals are flicked on prematurely, other operators may draw incorrect inferences about where the turn is about to be made.

b. At a signalized intersection it may be appropriate to enter the intersection and wait for a safe gap in traffic to complete a left turn movement.

c. Keeping your wheels straight when you stop to wait for a safe gap in traffic to make a left turn, minimizes the chances of being driven into the lane of oncoming traffic if struck from the rear.

d. Entering the crossroad close to a right angle when making a left turn at a "Y" intersection will improve vision and reduce the time your vehicle is in a vulnerable position during the turning process.

e. Wait to make your turn onto a main highway until you have space and time to gain cruising speed without interfering with the progress of other vehicles.

f. Conflicts at intersections are reduced by turning into the first lane going in your direction. Traffic engineers sometimes modify this principle to meet local conditions.

5.3 Through an understanding of the hazards involved, and heeding certain elementary but crucial precautions, operators can safely cross train-car intersections.

a. Operators should consider that:

(1) most railroad crossing accidents result in fatalities;
(2) a train gives the illusion of going slower than it is actually travelling;
(3) by the time that an engineer can tell that your car is in the way, it is already impossible for him to stop. (A full emergency stop from 60 mph takes 1½ miles.)
(4) in a large percentage of railroad crossing accidents the vehicle runs into the side of the train, because the operator was overdriving his vision and perception; and
(5) with fatal results, some operators have taken familiar crossings for granted and assumed that no train would be coming. (You are just as dead if struck by an unscheduled train.)

b. To move safely through a vehicle-train intersection:

(1) make certain the engine is thoroughly warmed up before attempting to cross the tracks;
(2) identify and conform to warning signs, signals and protective devices;
(3) look and listen for approaching trains, but do not put the sense of hearing under handicap (reduce the radio volume, crank down the side window, and stop the conversation);
(4) if a train is approaching close enough to constitute a hazard, or if the warning signals or gates are operating, stop a safe distance from the nearest rail;
(5) wait for a train to clear a sufficient distance to insure good visibility because another train may be coming from the same direction, or from the opposite direction on an adjacent track; and
(6) drive onto a railroad track only when you are certain that you have sufficient speed so that the momentum will carry the car past the tracks should the engine fail, and make certain that no other vehicle in front can prevent your uninterrupted crossing.

c. If in spite of all these precautions the vehicle stalls on the track:

(1) get everyone except yourself out of and well away from the car immediately;
(2) if a train is in sight get out and leave the tracks in the direction from which the train is coming to avoid being struck by fragments;
(3) if no train is in view, try to start the engine, checking every few seconds to make sure that a train is not coming (not if the tracks curve out of sight in less than one-half mile); and
(4) if the vehicle fails to start perhaps you can push it off the track, or in a manual transmission, put in low gear and use the starter.

Episode Delineation Form

UNIT B Title: Interacting With Other Highway Users

EPISODE 6.0 Title: Pedestrians and Animals

EPISODE PURPOSE: The majority of urban traffic fatalities occur to pedestrians. This is so, not because the number of vehicle-pedestrians accidents exceed vehicle-vehicle collisions, but rather because vehicle-pedestrian accidents are more likely to be fatal. Pedestrians are highly vulnerable.

Up to now, driver education students have been, for the most part, in the role of pedestrians interacting with motor vehicle operators. Now they will be changing roles frequently between vehicle operator and pedestrian. (A person who just parked his vehicle is a pedestrian.) Since students have received considerable pedestrian education prior to driver education, the emphasis here will be from the perspective of the operator, to improve his perceptual skills and judgment with respect to pedestrians. However, students will be reminded that pedestrians bear legal and moral responsibilities also, and that cooperation between all highway users is most desirable.

Since accident facts remind us that animals along the highway present to drivers a problem similar to the pedestrian problem–both pedestrians and animals are maneuverable and unpredictable–that topic (animals) is also included in this episode.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
6.1	Crosswalks and Laws	Identify marked and unmarked crosswalks and state what implications they have for driver and pedestrian behavior.	
6.2	Types of Pedestrians	When shown pictures (or word descriptions) of pedestrians in traffic scenes, students will be able to classify pedestrian actions typical of various age groups.	
6.3	Critical Areas	Identify the places or conditions which are particularly critical as far as vehicle operator-pedestrian interaction is concerned, and select appropriate courses of action from given alternatives to minimize the hazard.	
6.4	Pedestrian Responsibilities	Describe the legal and moral responsibilities of pedestrians.	
6.5	Animals	Indicate why and where animals can be dangerous to the vehicle operator and what can be done to minimize these dangers.	
		Culminating Objective: In the driver education vehicle, students will apply with no hazardous error, safe and legal practices when interacting with pedestrians and animals.	

CONTENT

6.0 Motorists have the responsibility of taking proper precautions to avoid hitting pedestrians at all times and places, even if they jaywalk.

6.1 Because he is so vulnerable, fragile and without protection, the pedestrian has been given the right-of-way over the vehicle at all intersections and at any other point at which a crosswalk has been placed across a street. In fact, under no circumstances is the operator of a motor vehicle privileged to exercise the right-of-way over a pedestrian.

a. Usually, intersection crosswalks will be marked, but even if they are not, a pedestrian has the right-of-way from curb-to-curb. (The crosswalk is the extension of the sidewalk at the intersection.)

b. Marked crosswalks may be designated anywhere they are needed.

c. Pedestrians on a crosswalk (unless walking against a red light) have the right-of-way over vehicles.

d. Crosswalks give the pedestrian more protection in some states than others. One state's Appeal Court ruled that "The pedestrian is entitled to as much space as will afford him safe passage without such threat of interference that will reasonably cause him to step back or hesitate."

6.2 If we consider the way a pedestrian looks at vehicular traffic it will help us to predict pedestrian behavior. Perceptions of pedestrians vary with the individual and changes with the age of the person.

a. Since the pedestrian does not need to comply with a licensing law, or meet an age regulation, all kinds and ages of people walk on the streets and highways.

b. Many pedestrians are non-drivers (older people and children), but practically all drivers are pedestrians at times.

c. You can assume that children, old people, non-drivers, or anyone impaired by alcohol or drugs may have deficient judgment.

d. Elderly pedestrians tend to base their judgments on when to cross on the movement of other pedestrians and vehicles, rather than on traffic signals.

e. The speed of an oncoming vehicle (closure rate) is difficult to judge, even for a pedestrian with perfect eyesight and excellent depth perception.

6.3 Operators should be especially alert for pedestrians:

a. around schools, churches, parks and playgrounds;

b. when children are playing on or near the road (they may dart out or throw objects on the road);

c. at intersections, and in mid-block locations where there are department stores on opposite sides of the street;

d. anywhere near a school bus;

e. after dark, almost anywhere;

f. near military installations;

g. while passing parallel parked vehicles, and delivery trucks (possibility of people alighting from these vehicles);

h. along any roadway bordered by a solid fence, buildings, or bushes; on school and college campuses;

i. whenever there are people on foot near the roadway; and

j. whenever the weather is bad–wind, cold, rain and snow.

6.4 Although the pedestrian has been granted certain protective privileges, he bears certain legal and moral responsibilities in traffic.

a. The pedestrian is expected to cross city streets at crosswalks, if a hazard is created by doing otherwise.

b. At signal controlled intersections the pedestrian is required to obey the "walk" and "do not walk" signals.

c. The law does not allow the pedestrian to leave the curb suddenly and walk into the path of a car close enough to cause a hazard.

d. If you are the pedestrian and have to walk on a country road at night:

(1) stay off the travelled portion of the highway;
(2) walk toward oncoming cars so that you can see them;

(3) wear or carry something that has a light color (below the waist because of headlights), so drivers can see you; and
(4) preferably, carry a light.

e. While a pedestrian is subject to certain laws, they are rarely enforced against him in most cities. (Pedestrian violations have low priority.)

6.5 Animals are especially unpredictable, but if an operator is alert for the potential hazard of an animal dashing into his path without warning, and adjusts his speed accordingly, collisions can be avoided.

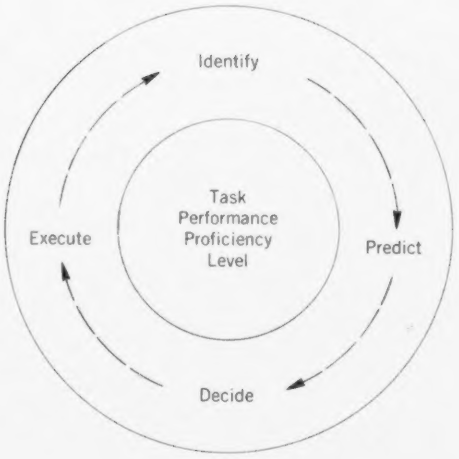
a. Knowing the habits of deer is one way of helping to reduce the numerous vehicle-deer accidents. (estimated that well over 100,000 dear are killed annually by vehicles.) (106)

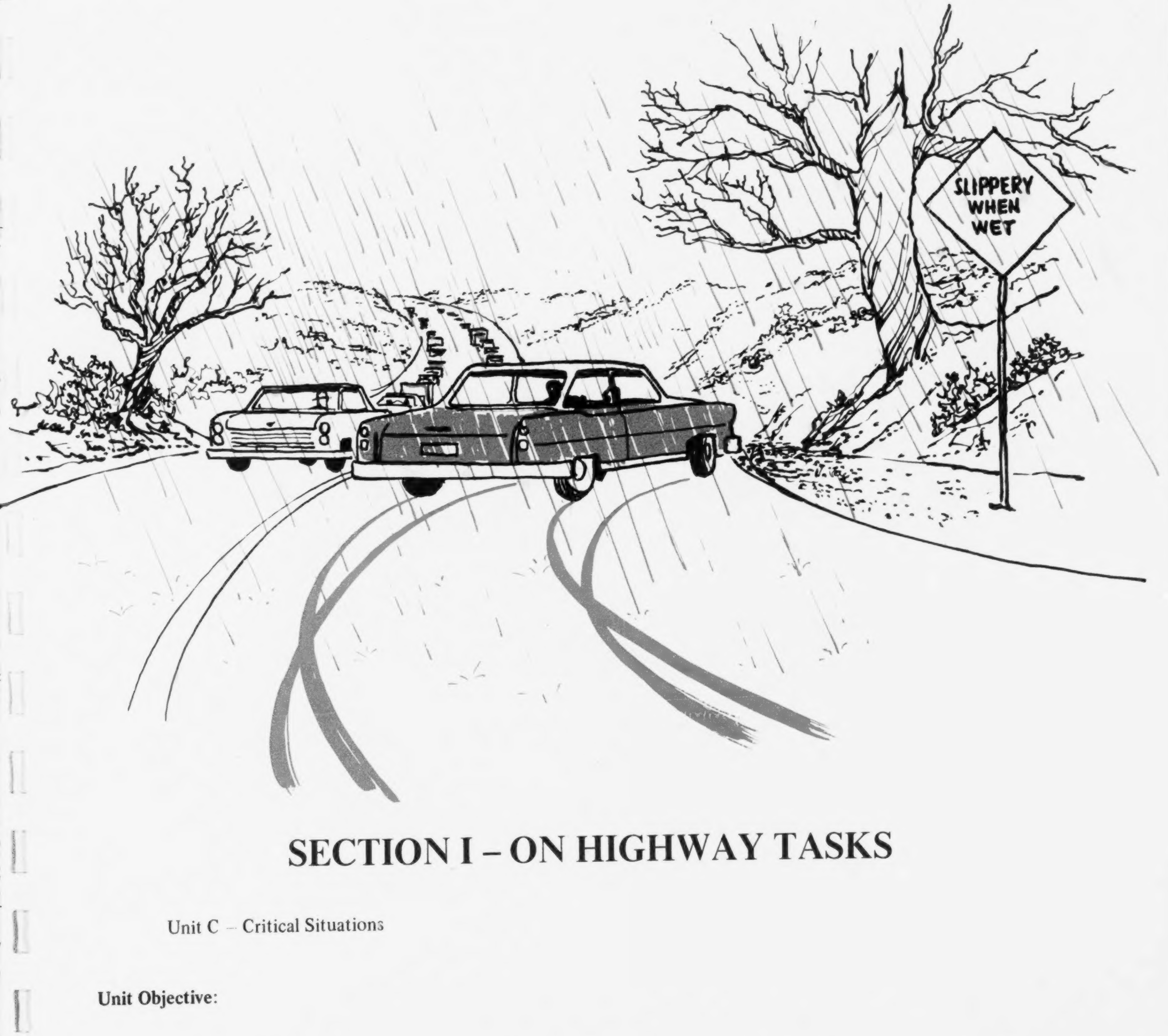
(1) Normal daily movements of deer include crossing highways. (Heed deer crossing signs by speed reduction.)
(2) Deer are attracted to roadways for feeding, an activity undertaken chiefly during the hours of darkness. The road shoulder normally offers highly palatable grasses and legumes.
(3) One deer often means that more deer are present.
(4) It is believed that the shadow behind the animal created by the headlight startles the deer when he moves, so that he bolts out into the path of the vehicle.
(5) Many deer will change direction and bounce back across the road when confused. They usually retreat in the direction from which they came.

b. Observation, speed reduction and a state of readiness are the most effective responses for the driver when there is a possibility of an animal threatening his path.

(1) Operators need to watch for dogs and cats along the roadside, and adjust speed and position to minimize the threat.
(2) At night the reflective eyes of an animal are a cue to the operator to be on the alert.

c. Some dogs have a fondness for chasing all forms of motor vehicles. (Operator is usually successful in speeding up to escape from the dog.)





SECTION I – ON HIGHWAY TASKS

Unit C – Critical Situations

Unit Objective:

Students will be able to demonstrate the correct techniques for coping with critical situations (some under simulated conditions).

Episode Titles:

1.0 Response Analysis

2.0 Traction Loss

3.0 Vehicle Malfunctions and Failures

Episode Delineation Form

UNIT C Title: Critical Situations

EPISODE 1.0 Title: Response Analysis

EPISODE PURPOSE: Occasionally, even the most competent operator is confronted by a critical situation caused by hazardous roadway conditions, mechanical malfunction, or an unpredictable outside force or obstacle. Therefore, the "complete" operator is prepared to cope with these situations.

This episode aims to help the student understand how the human functions in driving are "short-circuited" (from identify to execute) in many critical situations, and what implications this reality has for driver behavior. The concepts learned here serve as background information and motivation for the next two episodes.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
1.1	Typical Responses	Identify critical situations that occasionally face a vehicle operator, predict how unprepared operators are likely to respond, and explain why they respond that way. Students will be expected to relate their analysis to the basic human functions–identify, predict, decide and execute.	
1.2	Pre-Conditioning	Explain how a vehicle operator can increase the probability of responding correctly in a critical situation and illustrate with examples in both non-traffic and traffic situations.	

CONTENT

1.0 A conditioning process and constant vigilance will help the operator to prevent critical situations from going beyond the point of no escape.

1.1 Critical situations (skidding, brake failure, tire blowout, etc.) allow little or no time for decision-making, and frequently produce the wrong response.

a. Skilled reactions tend to become disorganized under emotional stress or panic.

b. Most operator panic, or near panic occurs, when the operator is *surprised* by a hazard.

c. A strong stimulus which surprises the operator tends to produce an impulsive or unplanned response.

d. Correct automatic reactions must be learned in advance, otherwise, emergencies may and frequently do evoke an improper response.

1.2 Some experience with a critical situation, either in reality or by means of mental rehearsal, reduces the emotional impact and increases the probability of performing the correct response.

a. Panic can be avoided by thinking (panic tends to paralyze the reasoning center of the brain) and that is why it is so important to know what to think and how to perform.

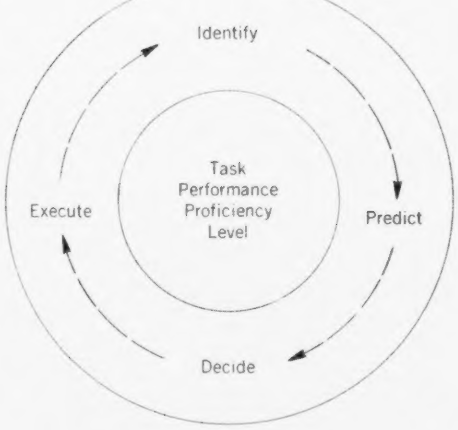
b. The ability to cope with roadway and vehicular emergencies depends somewhat upon the operator's mental set while he is operating the vehicle.

c. Difficulty and danger prevent real-world rehearsal of many critical situations (skidding, brake failure, etc.), but knowledge of what to do and practice via the imagination can help one to respond correctly.

d. By creating a continual series of imaginary situations and hazards (hypotheses or guesses based on experiences) an operator prepares himself in advance to do the right thing in a crucial situation.

e. After much imagination and repetition, these mental sets tend to sink below the level of awareness and become semi-automatic.

f. The operator who can control *himself* in an emergency is the kind of person who would be more apt to control his vehicle.



Episode Delineation Form

UNIT C Title: Critical Situations

EPISODE 2.0 Title: Traction Loss

EPISODE PURPOSE: This episode is designed to prepare students to maintain vehicle-roadway stability under adverse surface conditions, and during emergency stops. (Unit A should be reviewed in preparation for this Episode.) Unfortunately, most driver education programs cannot include practice in skidding, but mental conditioning can take place through simulated exercises. Furthermore, students can acquire insights to the causes and prevention of skidding, which may not guarantee correct response, but will help facilitate the learning of emergency skills.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
2.1	Overpowering	Classify the causes, prevention and correction for the traction losses included in Segments 2.1 through 2.6.	
2.2	Overbraking		
2.3	Turns and Curves		
2.4	Unequal Traction		
2.5	Hydroplaning		
2.6	Snow, Mud or Sand		
2.7	General Measures	Formulate a set of principles and practices for preventing and correcting any kind of traction loss.	
		Culminating Objectives: In the driver education car, demonstrate understanding of the principles involved in traction loss by maintaining traction between the tires and the road surface at all times. Note: Some teachers go farther and require students to learn the techniques for correcting a traction loss. This is usually accomplished in protected areas.	

CONTENT

2.0 When tires lose their rolling grip (traction) on the pavement, the result is partial or complete loss of control of the car.

2.1 Traction is markedly reduced when your wheels are spinning, the consequence of "over-power," usually on take-off.

- a. If a skid occurs in this type of traction loss, the rear end attempts to pass the front end in a spin-around skid. Once a car spins beyond a certain angle, estimated to be about 20° to 25°, control is totally lost.

- b. Over–powering on a curve permits centrifugal effect to take over.

- c. The skill of starting on a slippery surface lies in applying the power to the drive wheels so that they grip gently and gradually.
  - (1) For manual transmission, start in second or high by slipping the clutch.
  - (2) For automatic transmission, brake with the left foot, apply gentle acceleration, then gradually release brake pedal to accomplish gradual power transmission to the drive wheels. Automatic transmissions tend to make sudden transmissions of power because slight "windup" of the engine is required to make the transmission function.

2.2 Traction is lost when your wheels are skidding from over-braking, brake malfunction, or improper use of the shifting lever and the accelerator.

- a. When the front wheels lock due to improper brake adjustment, steering is ineffective and rear wheels act as a rudder to keep car going straight ahead. (Release brakes and slow down.)

- b. When rear wheels lock, caused by brakes out of adjustment, the back end of the car tries to pass the front end. (Remove foot from brakes and slow down and counter steer in the direction of the skid momentum.)

- c. When the grip of the brakes or tires is unequal, the car tends to swing or pivot around the wheel where the grip is the strongest.

- d. An all-wheel braking skid occurs in a panic stop even with good brakes. To regain traction release brake because you *cannot steer a skidding car when all four wheels are locked.*

- e. Changing to a lower gear ratio on icy surface at too fast a speed can "trigger" a skid; and releasing the accelerator suddenly can produce the same result.

- f. If an urgent stopping situation develops on a slippery surface, intermittant application of the brake pedal (cadence braking) will prevent wheel lock-up and enable the driver to maintain steering control.

2.3 Skidding or sliding on turns or curves occurs when the inertia force is greater than the side thrust friction force of your vehicle. The cause is an improper combination of speed and direction change.

- a. Rear wheels skid from oversteering; front wheels skid from understeering.

- b. A constant speed, suitable for conditions (curvature and coefficient of friction) will prevent sliding action on curves.

2.4 When the wheels of a vehicle generate unequal traction due to pavement conditions, control of the vehicle may be threatened without any changes in direction or speed.

- a. Ice is not uniform (rough versus smooth, dry versus wet).

- b. Icy or snowy patches are sometimes found where the sun does not shine on the road surface.

- c. When one or two wheels drop off the edge of the pavement, unequal braking and steering result.
  - (1) A firm grip on the steering wheel is necessary to keep the car travelling straight ahead straddling the pavement edge. (Fight the tendency of the wheel to pull right.)
  - (2) The driver must resist any immediate urge to whip the car back on the pavement.
  - (3) By *easing* off the accelerator the motor will slow-down the vehicle gradually.
  - (4) If braking seems necessary, a gentle on-off technique enables the driver to maintain control.
  - (5) A thorough visual check ahead, to the side, and to the rear is essential before returning to the roadway.
  - (6) After speed has been reduced, the wheels can be turned sharply (depending upon the shoulder drop), permitting the vehicle to climb the pavement edge.

2.5 The right mix of speed, fluid on the road surface and tire tread can result in a vehicle losing all contact with the road and therefore, loss of traction. (Hydroplaning).

a. As speed increases on wet road surface, a wedge of fluid builds up at point of contact between the tires and road until the tires begin to ride on ("plane") the film of water. Usually the operator has no warning of when the critical speed has been reached until a change in speed or direction throws the car out of control.

   (1) At 30 mph or less, tires with tread will cut through the water and remain in complete contact with road.
   (2) At 30 to 55 mph, water wedge may penetrate tire-road contact and partial hydroplaning results.
   (3) At 55 mph or more, water wedge may increase and tires lose complete contact with road.

b. Besides speed, whether or not hydroplaning occurs depends upon the depth of water on the road surface, tire tread (depth and design) and tire pressure, wheel alignment and road surface.

   (1) Tires with open-treading (outlet for fluid) plus siping (thread-like design in a tread) tend to push the water out of the way in a squeegee action.
   (2) Properly inflated tires with good tread can cut better into a film of water on the road surface, and prevent a "space pocket" from forming under the tires.
   (3) The deeper the surface fluid the more likely that the water will choke the open spaces in the tire tread.
   (4) A form of hydroplaning can result from ordinary road film lubricated by a little moisture. (Happens in the first five minutes of a rain storm; or fog and dew can provide the needed moisture.)
   (5) Improvements in road surfaces (grooving) and tire design will help to reduce the hydroplaning hazard.

c. To prevent and respond to hydroplaning:

   (1) drive with well-treaded tires, properly inflated;
   (2) reduce speed below hydroplaning speed particularly when approaching curves or other changes in pitch or incline in the road; and
   (3) if hydroplaning should occur, decelerate and wait for tires to regain traction.

2.6 With "know-how" and proper equipment an operator can extricate his vehicle if it becomes mired in snow, mud or sand.

a. The most effective means of moving a vehicle mired in snow or mud is to provide better friction between the drive wheel tires and the surface by spreading sand, cinders, an old piece of carpeting, traction mats, pieces of brush, or anything else that increases friction.

b. Sometimes the process of "rocking" the vehicle, skillfully, will be the solution. (A questionable practice in an automatic shift vehicle.)

c. When you are stopped on two different surfaces, one rear wheel may encounter less resistance to turning than the other—one spins while the other does nothing.

   (1) On most vehicles, if one wheel spins, the car is just as stuck as though both were spinning.
   (2) Some cars now have a limited-slip differential system that forces both wheels to turn, even though one has very little traction.
   (3) If the vehicle has front-wheel drive, then traction is required under the front wheels to move the car.
   (4) Vehicles with four-wheel drive have a considerable advantage in maintaining traction.

d. To reduce the probability of becoming stuck in mud, snow or sand:

   (1) make every effort to keep moving—shift into 2nd or low gear before entering the section;
   (2) gain speed before attempting to turn (avoid sharp turns); and
   (3) try to avoid driving in deep ruts—look for solid ground in the center of the roadway or on the shoulder, or straddle the ruts.

e. If engine stalls in a snow bank, open the car windows and shovel the snow away from the exhaust pipe before trying to extricate the car to prevent the danger of carbon monoxide poisoning.

2.7 A competent operator rarely allows his vehicle to lose traction, but if he does, he possesses the capability to cope effectively with the situation.

a. The probability of skidding can be minimized by:

   (1) keeping brakes and tires in good condition;
   (2) lengthening sight distance and reacting to developing hazards well in advance;
   (3) matching vehicle speed to road conditions;
   (4) smooth and gradual speed control, tracking and braking (avoid overpowering, oversteering and overbraking);
   (5) periodically checking the "feel" of slippery surface by gently applying the brakes when there is no traffic near; and

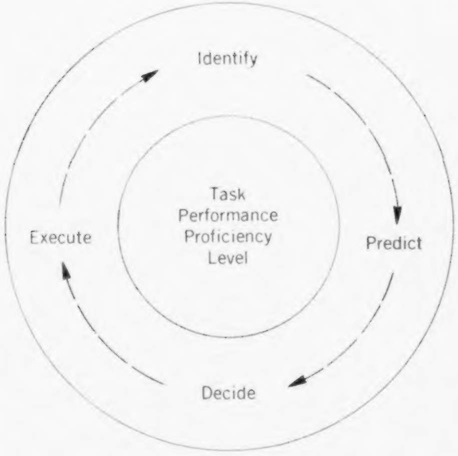
(6) staying off the highway when road surface conditions are extremely hazardous.

b. To regain traction and return the vehicle to its normal course when the rear end of the car slides around:

(1) steer in the direction of the skid only far enough to point the front wheels in the direction you want to go (over-correction can cause a violent counter-skid to the opposite direction);

(2) as soon as you feel the rear end starting to return to course, return the steering wheel to its straight ahead position; and

(3) be ready for a counter-skid, and if it develops again, steer in the direction of the skid only far enough to point the front wheels in the direction you want to go.



Episode Delineation Form

UNIT C Title: Critical Situations

EPISODE 3.0 Title: Vehicle Malfunctions and Failures

EPISODE PURPOSE: This episode stresses the procedures to be followed when critical situations "triggered" by vehicle malfunction and failure occur unexpectedly. Through simulated drill, students will learn how to respond quickly and effectively, so as to minimize the danger.

A good vehicle maintenance program helps to reduce the probability of a vehicle malfunction or failure, but does not completely eliminate the possibility. Drivers should be mentally prepared for such an event, so that the surprise of the event does not produce panic.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
3.1	Brake Failure	Describe the steps drivers should follow to handle the *vehicle malfunctions and failures included in 3.1* through 3.9.	
3.2	Steering Failure		
3.3	Tire Failure		
3.4	Accelerator Stuck		
3.5	Headlight Failure		
3.6	Hood Flies Up		
3.7	Engine Stalls		
3.8	Engine Overheats		
3.9	Emergency Stop		
		Culminating Objective: In the driver education vehicle, at the teacher's command and effort to simulate the vehicle failure, execute the proper steps to maintain control until the vehicle can be moved off the highway and stopped. In the case of 3.8 and 3.9, students will demonstrate the steps they would follow *after* they stop the vehicle in a safe place.	

CONTENT

3.0 When a sudden vehicle malfunction occurs, particularly to one of the basic control devices, the operator's skills and emotions are tested.

3.1 Any decrease or loss in braking power compels the operator to maintain steering and positioning control and regain speed control.

a. Brake failure or malfunction results from:

(1) a leak in any part of the hydraulic brake system–affects all four wheels equally ("sinking brake pedal");
(2) loss of friction between the drum and the lining due to overheating ("fading brake pedal") or in the case of an old car the brakes may get wet;
(3) air trapped in the brake lining system, or twisted or worn brake hose ("spongy brake pedal"); and
(4) breakdown of some mechanical linkage within the system.

b. When brakes fail:

(1) pump the brake pedal in an attempt to build up pressure and restore braking action long enough to get off the road;
(2) if that action does not suffice, set the parking brake with a slow steady pressure; and, at the same time, hold release lever in "off" position to prevent brake lock-up that could cause the vehicle to skid out of control;
(3) downshift to permit engine braking to help reduce speed;
(4) find an escape route–a safe exit from the highway; and
(5) while struggling to maintain steering and speed control, communicate your emergency situation to other highway users threatened by the situation. (sound horn, flash lights)

c. In extreme cases it may be necessary to slow the vehicle by:

(1) running along an embankment;
(2) scraping against a curb;
(3) driving into bushes, hedges, or snowbank; or
(4) sideswiping a row of parked cars.

d. If loss of braking power or uneven action results from wet brakes, dry them quickly by:

(1) staying in low gear and pumping gently; or
(2) applying slight pressure on accelerator while brakes are being applied with the left foot. (This technique can also be used after driving through water to dry wet brakes.)

3.2 Steering failure is another critical situation, somewhat uncommon, but extremely dangerous when it does happen.

a. If you have power steering and the power fails, you can still gain control by gripping harder and steering more firmly.

b. If something has gone wrong with the steering linkage, all you can hope to do is stop as quickly and safely as you can.

3.3 Steering control is threatened when a tire blows out or the air pressure diminishes suddenly.

a. If a front tire blows out, the front wheels tend to be pulled in the direction of the blowout.

b. If a rear tire blows, the rear of the car may swerve or sway violently.

c. No matter which tire blows out:

(1) promptly firm your grip on the steering wheel and apply whatever steering input is required to hold a straight course;
(2) ease up on the accelerator, allowing engine braking to slow the car;
(3) brake with a firm, steady pressure, avoiding wheel "lock-up";
(4) look for an escape route when the vehicle is under control, and drive *entirely* off the road to a level spot where you can change the tire in safety, even though you may ruin the tire; and
(5) set the parking brake to the maximum tension and move the selector lever to PARK (manual shift car–place the gear in reverse or low).

d. A tire emergency does not end with getting the car stopped, because you have either to call for help or change the tire. Directions for use of the jack usually are mounted on the inside of the trunk lid.

e. Captive-air tires (a tire within a tire) practically eliminate roadside tire changes.

3.4 When the accelerator pedal sticks, power must be cut off the drive wheels.

a. Immediately place the gearshift lever in neutral, apply brakes, pull off the road where the pedal can be safely released, and turn off the ignition. (Try to find and remedy the trouble.)

b. In a manual shift car, depressing the clutch will serve to disengage the power from the rear wheels.

c. If the vehicle does *not* have power brakes or steering, turning off the ignition first is an alternative technique.

3.5 Even with careful maintenance, a critical situation involving headlight failure may arise. Sometimes you will be able to bring them back temporarily by hitting the dimmer switch, but, if not, perform the following steps:

a. slow down quickly, keep the car in its path, and look for an escape route;

b. as you slow down, watch for anything that can help orient you;

c. try the parking lights, or any auxiliary lights on the car (spot lights or fog lights);

d. flash the brake lights, and turn on the right turn signal.

3.6 If the hood flies up while driving, it is somewhat like having a curtain drawn in front of your face.

a. Look under the center of the opened hood, or out of the left window, steer carefully off the road and stop.

b. To prevent this situation from occurring, check to see that the hood is properly closed after you or a service station attendant has opened it.

c. If hood vibrates as you drive, stop immediately and make sure that it is closed properly.

d. If the situation has occurred, make sure the safety latch is operative before proceeding.

3.7 When the engine stalls during movement:

a. usually it can be re-started by placing the selector lever in "N" (clutch down in manual transmission) and turning the starter switch while the car is moving;

b. an alternative in a manual shift car is clutch down, gear shift lever in second gear and clutch out slowly;

c. if these techniques are unsuccessful, look for the first opportunity to signal; drift off the roadway.

3.8 If engine overheating occurs, as revealed by the temperature light or gauge;

a. pull off the road, place shift lever in neutral, and run engine at a fast idle to circulate water and cool it;

b. watch the temperature indicator–if temperature reduction is not quickly apparent, stop the engine;

c. raise hood but do not remove cap–wait for engine to cool and, while waiting, examine for external leaks, broken fan belt or anything that might slow the movement of the coolant or air;

d. when system cools, remove cap carefully and check coolant level (if near normal and there is no rusting, apparently the trouble is mechanical); and

e. if service station is nearby and the system has cooled drive slowly; otherwise have the car towed. (The trouble may be with the water pump or the thermostat.)

f. if fire breaks out under hood:

(1) use a dry chemical fire extinguisher;
(2) if a fire extinguisher is not available try to smother the fire with a blanket;
(3) if fire is out of control get at least 50 feet from the vehicle as the gas tank can explode.

3.9 Sooner or later, almost every driver has the experience of his vehicle becoming disabled or out-of-gas.

a. If the vehicle fails on the traveled part of the road, make every reasonable effort to get it off the roadway by coasting, pushing, or using the starter in a manual transmission. If unsuccessful:

(1) turn on warning flashers and protect the scene;
(2) tie something white to the door or radio antenna–raise hood and trunk; and
(3) seek help (see below).

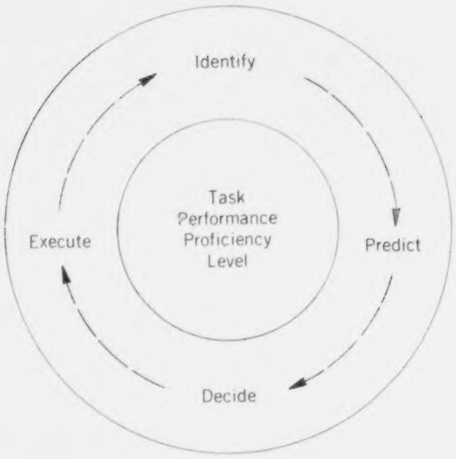
b. Assuming that you were successful in moving the vehicle well off the pavement, then:

(1) get out on the right side if you are anywhere near the stream of traffic;
(2) at night use your "emergency" turn signal switch, turn on your dome light, and place emergency flare or lights if you have them;
(3) as a signal to passing motorists that you are in trouble, particularly on a controlled access highway, raise the car hood and tie a white cloth to the left-hand door handle or radio antenna;
(4) in isolated areas women should stay in the car, locked and closed up, and wait for the police. (Wave strangers by and tell them help is on the way.);

(5) protect yourself from unscrupulous ("quick-dollar") towing operators by knowing more about towing *your* car than the man you hire: (a) you will find the towing procedure in your car Owner's Manual; (b) be certain the car *must* be towed– reputable towing operators carry spare cans of gasoline and a booster battery; and

(6) learn from experience–keep the gasoline tank between half and full, and the car in good condition.

c. To "stretch out" a low supply, use easy starts, moderate speed, coasting, and if necessary sway the car from left to right to get the fuel out of the low end of the tank.


Identify
Task
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SECTION I – ON HIGHWAY TASKS

Unit D - Controlling The Consequences of Highway Collisions

Unit Objective:

Students will be prepared to assume their moral, legal and financial responsibilities if they are involved in, or come upon the scene of, a highway collision.

Episode Titles:

1.0 Highway Accidents
2.0 Minimizing Impact Forces
3.0 At the Collision Scene
4.0 Financial Responsibility

Episode Delineation Form

UNIT D Title: Controlling The Consequences Of Highway Collisions

EPISODE 1.0 Title: Highway Accidents

EPISODE PURPOSE: The highway transportation system has been a major factor in this country's progress. However, as with fire, nuclear energy and other useful instruments, the characteristics which make the automobile useful also make it potentially dangerous. And our inability to control adequately the dangers associated with the use of the vehicle, has produced a major problem in the United States.

The present episode exposes students to traffic accident data as a reminder of the price our society pays for tolerating the dangers resulting from vehicle use. In addition, the content emphasizes (1) how accident records can be used to remove deficiencies in the system, (2) that most accidents are due to inefficiencies and therefore can be controlled, and (3) that traffic accidents are due to multiple causes and therefore need multiple solutions. It is assumed that if students internalize this information they will take a more realistic and vital interest in highway safety during and after the formal course experience.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
1.1	Traffic Accident Facts	Classify traffic accident data, and suggest implications of this data for system improvement.	Teacher-led presentation of national, state and local traffic accident data. (Visual aids) Analysis of charts and graphs of traffic accident data looking for underlying reasons that explain the surface facts.
1.2	Accident Records	Summarize the purposes served by a good accident reporting system.	Teacher-led presentation emphasizing the characteristics and values of a good accident reporting system. (Use of tables, charts and spot maps.)
1.3	Accident (definition)	Define the term "accident," emphasizing "preventability" rather than "chance."	Students will test the appropriateness of the dictionary definition of "accident" by applying it to an accident with which they are familiar. Students will ask a number of other people of various ages to define "accident," and a committee will summarize the results. Each student will formulate a definition of "accident" based on ideas that evolved out of the previous activities.
1.4	Multiple Cause Concept	Define the multiple cause concept, and identify the implications this concept has for driver behavior and highway safety management.	Students will analyze the factors involved in a traffic accident to determine "the" cause, and from this process they will discover that accidents have multiple causes involving all three components of the system. (See pages 147 to 149 for a complete description of this learning activity as an example of the inquiry process.)

CONTENT

1.0 Highway accidents and congestion reflect a breakdown or malfunction in the system, and thus provide one measurement of the system's efficiency and effectiveness. The function of the system is to move people and goods from origin to destination: accidents represent a failure in the task.

1.1 Properly interpreted, highway accident facts reveal the magnitude and trends of the problem, and serve as valuable indications or clues as to causative factors.

a. Highway accidents represent a major social and economic problem. A few examples follow to illustrate the loss in human resources.

(1) At the present annual toll of fatalities the two millionth person will be killed on our highways in the mid-1970's.
(2) The mileage fatality rate (per 100 million miles driven) in the United States declined quite steadily from 9.8 in 1946 to a low of 5.16 in 1961. It has fluctuated only slightly since then.
(3) On the average one person dies as a result of a motor vehicle accident every 10 minutes, and a personal injury occurs every 17 seconds.
(4) Accidents are the leading cause of death in the U.S. from age 1 through age 37; and motor vehicle accidents are contributing the largest single portion of these deaths.
(5) For youths aged 15 to 24 years, motor vehicle accidents cause more than 40 percent of the total number of deaths.
(6) Fatal accidents amount to only a small percentage of the total number of accidents and therefore are not a reliable measure of overall highway accident trends.

b. An analysis of rural-urban traffic accident statistics reveals some widely different distributions of accident types.

(1) Approximately two-thirds of motor vehicle deaths occur in places classified as rural, and victims are mostly occupants of motor vehicles.
(2) In urban areas about two-fifths of the fatalities are pedestrian.
(3) Approximately one-third of rural fatalities result from one-car accidents.
(4) Injury and property damage accidents occur more frequently in urban places.

c. Most *non-fatal* highway accidents appear to happen to average people under normal circumstances. (The ordinary accident and the fatal accident appear to have quite different characteristics.)

d. The highway accident problem is affected by various social, economic, political and medical factors which relate to the system; such as depressions, riots, wars, urban planning, alcohol and drug use, medical services and other factors.

e. If highway accidents and their consequences are to be reduced, a well planned, well funded, aggressive attack will be required, because each year more drivers are driving more vehicles a greater number of miles.

1.2 A good accident records system and accident prevention program go hand- in-hand. The records system identifies critical problems that can be called to the attention of the appropriate agencies.

a. An accurate understanding of the magnitude of the traffic accident problem has not yet become possible, because so many vehicular accidents are not reported to traffic authorities.

(1) Accident reporting is a matter of local or state jurisdiction, and not centralized for the nation as a whole.
(2) Not all persons are aware of their accident reporting responsibilities.
(3) Criteria for reporting differ from area to area.
(4) Many accidents occur in places remote from offices of central reporting authorities.
(5) Drivers fear they may be subject to penalties, such as revocation of driver's licenses and loss of automobile insurance if they report accidents which are traceable to their own negligence.

b. A systems approach to accident reporting seems to be required so that man-machine-environmental interaction can be analyzed.

c. A good accident reporting system can identify both high accident locations and unsafe drivers, important information to system improvements.

d. Because of built-in limitations, a traffic accident records system cannot furnish definitive data on underlying causes, comparisons between ages and sexes (exposure is a key variable), and other factors, but the system can suggest hypotheses ("hunches") to researchers which can be tested by sophisticated research studies.

e. For optimum efficiency and effectiveness, accident reports should be: (1) uniform, complete and accurate and (2) stored in one center in every state subject to rapid retrieval and analysis compatible with a national records system at the Federal level.

1.3 A highway accident is an unplanned event which frequently leads to personal injury or property damage, and is invariably preceded by an unsafe act and or an unsafe condition.

a. The common definition and fatalistic connotation of the word "accident" appears to be an obstacle to accident prevention efforts. To many, the word implies that something unexpected and unpleasant occurred but it:

(1) couldn't be helped, it was an accident;
(2) was inevitable and it would have happened to anyone;
(3) was unforeseen and uncontrollable; and
(4) is not our responsibility; we are not to be blamed.

b. A realistic appraisal of accident data clearly shows that *few* events currently labeled as accidents are really accidents in the sense of being purely chance events.

(1) Accidents, like other events, are caused, and, therefore, can be controlled when their causes are identified and understood.
(2) Frequently, events labeled as accidents are unforeseen, but they were not unforeseeable.
(3) Most accidents are not accidental, but rather reflect inefficiencies in the system. Accidents happen because people make mistakes.

c. Resulting injury or property damage is a consequence of an unplanned event and it does not in itself constitute the accident– it results from it.

(1) The injury or property damage is merely a "last happening" in a series of events, each of which to some degree contributed to the accident.
(2) When a driver falls asleep, but awakes in time to avoid a collision, the event is not recorded as an accident. A study of these near accidents would furnish clues to accident causation.
(3) The events recorded as accidents–those involving injury or property damage–represent only a very small percentage of the total number of unplanned happenings.

d. In addition to driving errors, human error also frequently underlies unsafe conditions (poor design, construction or maintenance); therefore, most accidents can be prevented by improving the competency of both drivers and the officials responsible for designing and managing the system.

1.4 Highway accidents, as well as other accidents, generally result from a combination of man-machine-environmental factors acting in a closely interwoven fashion (multiple cause concept).

a. Each of the circumstances which contributes to an accident is *a* cause, while *the* cause is the combination of these factors, each of which is necessary but none of which is by itself sufficient.

(1) A *circumstance* is any condition or action accompanying an accident whether it contributes to the accident or not.
(2) *A* contributing *cause* is a circumstance without which the accident would not have happened. A cause is always a circumstance, but a circumstance is not always a cause.
(3) Each cause, if it is truly contributing to an accident, is of equal importance in that accident.

b. Of the three components in the system (man–machine-roadway) the operator who almost always contributes one or more causes to the accident chain, is dominant in the sense that he possesses the ability to compensate for deficiencies in the other two components.

c. Operators may "get away with" violations for years because all the other essential ingredients for the accident are not present. On the other hand, an accident could occur the first time the violation is committed.

d. The accident chain may already have some links in it before the trip begins (fatigue, emotional upset, vehicle malfunctions, etc.).

e. Highway accident investigation, research, driver education and other efforts to improve the system should focus on the *interaction* of man-machine-roadway factors.

f. If the highway system can be designed so that motor vehicles, environment, and human tasks are compatible, and man is adequately prepared to perform the tasks, the probability of successfully reducing accidents and increasing system effectiveness will be greatly enhanced.

Episode Delineation Form

UNIT D Title: Controlling The Consequences of Highway Collisions

EPISODE 2.0 Title: Minimizing Impact Forces

EPISODE PURPOSE: Counter measures focusing on the "postcrash phase" contribute substantially to reducing the overall end results of human and property losses. Even if we do not reduce the number of collisions, injuries and fatalities can be reduced by (1) educating drivers regarding impact forces and the use of protective devices, (2) better packaging of vehicle occupants, and (3) improving vehicle and highway design. Success in the first of these three objectives, which suggests the purpose of this episode, will help to achieve the other two. In short, the aim here is to develop a generation of drivers who will employ the best means available for minimizing the consequences of collisions.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
2.1	Impact Forces	Predict the effect that different speeds and impact distances have on collision consequences. In addition, when given a series of emergency situations (via film, slides or diagrams) where a quick response is needed to avoid or reduce the impact of a collision, select the better course of action from the alternatives given for each situation.	
2.2	Packaging	Describe the similarities between packaging a fragile object for shipping and packaging the occupants of an automobile for driving.	
2.3	Restraint Systems	Explain the reasons for wearing a three-point safety belt.	
2.4	Motorbike Operator Vulnerability	Identify the measures available to a motorbike operator that will reduce the personal injury consequences of a collision.	
2.5	Highway Design	Given a series of pictures, identify good and bad features of highway and near-highway design with respect to collision avoidance and impact consequences.	
2.6	Vehicle Design	Identify and appraise vehicle features closely associated with operator efforts to avoid collisions.	

CONTENT

2.0 As a vehicle goes into motion, physical laws cause both the vehicle and the occupants to undergo changes that would affect the consequences should a collision occur.

2.1 The severity of injuries resulting from impact depends upon the peak load of the force, the distance in which the force is dissipated, and the distribution of the force.

a. Kinetic energy and angle of impact are major factors determining the force of impact in a motor vehicle collision.

(1) Doubling the weight of a moving body doubles the kinetic energy, but doubling the velocity increases the kinetic energy four times.
(2) In a collision, kinetic energy is dissipated by crushing and bending the metal of the vehicle and the object with which it collides.
(3) Low speed collisions can generate forces powerful enough to cause fatalities.
(4) Angle of impact relates to severity, so if you must hit something hit it at an angle in order to reduce the kinetic energy dissipated by impact.

b. In an automobile collision the momentum of the car and the occupants (or cargo) is dissipated in two separate but related collisions.

(1) The *first* collision occurs between the car and a tree, another vehicle, or some other part of the environment.
(2) When the vehicle decelerates rapidly from the collision, the occupants or cargo, if not secured, continue to move forward at the speed of the vehicle prior to impact. Cargo can become a lethal weapon in the process of dissipating its momentum.
(3) The *second* collision, a fraction of a second later, occurs between the occupants and some part of the car's interior or the environment outside of the car if the occupants are ejected.
(4) The first collision produces vehicle and possibly property damage, while the second collision may result in bodily injury or death.
(5) Man and vehicle are decelerated at different rates as they contact different obstacles offering different resistances. The car may strike a dirt bank, while the occupant strikes the windshield with his head.
(6) If the secondary impact can be prevented by a restraint system and other means, the only force that might cause injury is the rapid deceleration of the body.

c. Other factors equal, the force of impact varies *inversely* with the distance required to dissipate the force.

(1) If you strike a non-moving object (tree), the resultant force is greater than if you strike an object (vehicle) which is moving, or can be moved easily in the direction of your path.
(2) A rating of collisions from worst to least finds this order: head on; hitting a fixed object; rear end collision; and side swiping.
(3) It is better to steer off the highway (usually to the right) and impact bushes or a snowbank, which are capable of some energy absorption, than to hit another vehicle or an inmovable object.
(4) When a vehicle strikes an unyielding object such as a bridge abutment, the car itself does some collapsing (bumpers, fenders and hood), which lessens the force on the vehicle occupants.
(5) The probable impact surfaces of the vehicle should be deformable to increase impact distance and time ($\frac{1}{10}$ second compared to $\frac{1}{50}$).
(6) Collapsible steering wheels and padded instrument panels are vehicle design features which increase the time required to dissipate the momentum of the vehicle occupant when he impacts the car interior.

d. If impact force is distributed over a wider area, the chances of injury are reduced.

(1) Five pounds of force with an ice pick is too much.
(2) Some persons have survived unbelievably high falls because the impact was distributed over a large section of the body.
(3) Projections and edges, both inside and outside the vehicle, should be eliminated insofar as possible.

2.2 Most motor vehicle crashes involve forces which would be survivable if the occupants were adequately "packaged" within their vehicle.

a. Packaging vehicle occupants should follow principles similar to those used in shipping a fragile object.

(1) Just as a well designed container used to ship fragile items should not open and spill its contents, so should the doors of an automobile stay closed during an accident, keeping the passengers inside the car. Safety latches reduce the risk of occupant ejection, and locking the door reduces the chances of a door opening in a roll over or side collision.
(2) A container designed for safety of contents is yielding, so that it will cushion and distribute impact, but at the same time will resist crushing.
(3) Fragile objects shipped inside containers are normally protected by energy-absorbing materials. Padded sun-shades, instrument panels and collapsible steering wheels illustrate this principle in automobiles.
(4) Articles inside the package should be anchored to the container at their strongest points to keep them from moving inside the package. Seat belts must be anchored securely to the vehicle and worn snugly across the strongest parts of the body for offering resistance to collision forces.

b. Focal points of the packaging effort identified by automotive crash injury research are:

(1) *windshield* - leading cause of head injuries;
(2) *steering assembly* - produces the maximum number of injuries because the exposure is greater (a safety device in a sense– restrains the driver from moving forward upon impact);
(3) *instrument panel* - design of the instrument panel is critical when only a lap belt is used;
(4) *side door panels* - vehicle occupants are particularly vulnerable during side impact collisions;
(5) *head support* - to reduce neck injuries sustained from rear end collisions (should be adjusted low enough so the driver can glance over it during lane changes); and
(6) *rear view mirrors, sunshades, knobs, handles* - can produce injury.

2.3 Restraint systems appear to offer the single best protection for the automobile occupant during an impact, because they prevent ejection–a leading cause of death.

a. The best restraint system for American cars, at present, is the 3 point type which includes both a lap belt and a shoulder strap.

(1) The lap belt, correctly mounted and worn, provides support to the body's sturdiest framework, the pelvic girdle.
(2) The lap belt alone has the disadvantage of allowing the head and thorax to swing free in a "jack-knife" motion during impact, which frequently results in the head striking the instrument panel. (Without the belt, the head would probably strike the windshield.)
(3) In the smaller European cars there is much less distance between the occupant and any potential impact surfaces, so the lap belt is less effective in preventing or reducing injuries at impact than a system restraining the upper torso.
(4) The diagonal shoulder belt provides restraint to the upper torso, from the hip on one side to the shoulder on the opposite side.
(5) When the diagonal belt is used alone, there is nothing to prevent the lower torso from swinging forward and rotating out of the diagonal belt. *The shoulder strap is not to be used without a lap belt.*
(6) In the 3 point type, location of the upper belt anchorage can be critical in influencing the effectiveness of the system. This fact presents a problem to the designer who must consider:
    1. seat positions for a wide range of physiques;
    2. limited attachment points; and
    3. what to do with all the separate belts in one vehicle.

b. Usually at about the age of three or four, a child can begin using standard safety belts, but prior to that time special arrangements and devices are required.

c. Entrapment accidents (fire, car submerged in water), given as an argument against seat belt use, constitute a small fraction of all accidents; furthermore, in this type of accident you are more likely to stay conscious with seat belts fastened and so you are more likely to escape.

d. Recent court decisions have ruled that the plaintiff's failure to wear a safety harness–with which the car was equipped at the time of the accident–constituted contributory negligence.

e. New and better restraint systems will be developed. A "passive" restraint system, which does not require passenger activity, would be better.

2.4 The operator of a motorbike has some special problems and protective measures to consider.

a. Two-wheeled vehicles violate the "packaging" principle, since there is no enclosing structure to cushion and distribute the forces of impact, or to prevent the vehicle from spilling its contents.

b. In some instances (when a crash is inevitable) jumping is less dangerous than being thrown, because if you lose control of a motorbike you stand the chance of being trapped between the vehicle and the roadway surface.

c. Motorbike operators have means of limiting the extent of their injuries should a crash occur, namely:

   (1) approved helmet, meeting Federal standards, for rider and passengers;
   (2) approved face or eye protection;
   (3) gloves; and
   (4) sturdy outer garments–jacket, pants and shoes.

d. In equipping a motorbike the operator should consider that:

   (1) protrusions such as mirrors, extra lighting, roll bars and luggage racks may become instruments that can penetrate the body in a collision;
   (2) control levers should have "ball-ends" to prevent stabbing;
   (3) seat back rests may be lethal in a spill in which the bike spins;
   (4) exhaust pipes should be tucked away and shielded to prevent burns; and
   (5) high handlebars not only provide poor control, but may increase the severity of a collision.

2.5 Well conceived highway design can markedly reduce vehicle-vehicle and vehicle-object collisions, and in addition can minimize the severity of vehicle-object collisions.

a. That highway conditions do lead to accidents can be easily demonstrated by a "spot map" of traffic accidents.

b. Through the control of vehicle paths, highway design can separate vehicles and keep them from head-on and crossing conflicts.

   (1) When opposing lanes of traffic are separated *sufficiently*, head-on collisions are practically eliminated. (Appropriate guardrail placement and design helps when the medium strip is too narrow.)
   (2) When intersections are eliminated, intersection accidents are eliminated.
   (3) Controlled access highways have a much lower mileage fatality rate than all the nation's rural roads.

c. Near-path structures contribute to an increase in damages, injuries and deaths from automobile accidents.

   (1) Drainage ditches, guardrails (some with spear-like ends), abutments, poles, signposts, hazard warning devices, temporary barricades, trees, shrubs and parked vehicles are commonly impacted by vehicles in run-off-roadway type accidents.
   (2) Many of the near-path structures should and could be removed through the efforts of public officials supported by the public.
   (3) Highway engineers are now excluding many roadside features in the design of new highways.
   (4) Necessary roadside hardware such as sign supports, lighting standards and guard rails are being designed to minimize the consequences should impact occur.

d. Highway design features that protect "passively," that is, without "active" participation on the part of the driver or pedestrian (breakaway signs, lights, etc.) are usually preferable to those requiring active cooperation.

2.6 Vehicle design pays an important part in the operator's efforts to avoid the first collision, without which the second collision cannot occur.

a. A vehicle must have handling qualities so that it can be maneuvered quickly and accurately, and a high degree of stability so that it will hold the road when steered hard on unfavorable surfaces. Operators need a predictable steering system that gives them a "feel" of the road.

b. Collision avoidance depends in large measure on driver visibility, which is influenced by body design (windshield and windows, corner pillars, hood and fenders, headlights, turn signals, tail lights and stop lights, windshield wipers and rearview mirrors).

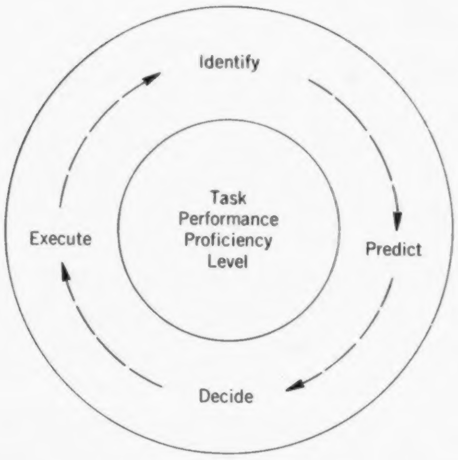
c. Accident avoidance also depends upon the mechanical durability and reliability of the vehicle, particularly with respect to power, steering and braking.

   (1) Improvements are being made in brakes and tires to aid braking performance, particularly in emergency stops (anti-skid device).

(2) Power steering helps to retain effective control when certain forces on the front wheels are increased (blow-out, wheels drop off the pavement edge, etc.).

d. Even when a collision appears inevitable drivers should use the maneuvering and other capabilities of their vehicle to maintain control and try to avoid a crash up to the last second.

e. Many improvements have been made in vehicle characteristics, and many others will be forthcoming as a result of research, along with consumer awareness and demand for safe vehicles.


Identify
Predict
Decide
Execute
Task
Performance
Proficiency
Level

Episode Delineation Form

UNIT D Title: Controlling The Consequences Of Highway Collisions

EPISODE 3.0 Title: At the Collision Scene

EPISODE PURPOSE: Very few people experience a lifetime of driving without becoming involved in a highway collision, either as a witness or a principal. This episode prepares students to cope with this eventuality, so that needless human suffering, financial loss, legal complication and other undesirable consequences can be prevented.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
3.1	Stopping	Given a description of an accident scene, describe: 1. when, where and how to stop; 2. what action to take regarding the injured, and summoning assistance; 3. how to mark and control the scene; and 4. what to do about exchanging information, witnesses and recording pertinent information.	
3.2	Marking and Controlling the Scene		
3.3	Assisting the Injured		
3.4	Words and Deeds		
3.5	Accident Reporting	Given the details of an accident and imagining he was one of the drivers involved, student will be able to fill out an accident report form and indicate where the form(s) should be sent.	
3.6	Emergency Medical Services	Identify the characteristics of emergency medical services that determine their efficiency and effectiveness in dealing with motor vehicle accidents. (Relate to local situations.)	

CONTENT

3.0 Many benefits can result from highway users being prepared to cope with post-crash situations when directly involved or when one of the first to arrive at the scene.

3.1 When a highway user has knowledge of when, where and how to stop following an accident there is less chance of a negative legal or safety consequence.

a. State laws require that the operator of a vehicle involved in an accident shall:

(1) immediately stop his vehicle at or near the scene;
(2) make the stop without obstructing traffic more than is necessary; and
(3) immediately return to the scene of the accident.

b. No matter what the degree of responsibility is in a traffic collision, the ultimate punishment is much less for the operator who stops, assists at the scene, and reports the accident to proper authorities, than it is for the person who leaves the scene. Panic, a mental state following a traumatic experience that tends to paralyze the reasoning center of the brain, sometimes causes people to "hit and run."

c. Highway users have a moral, if not legal, responsibility to stop when they come upon an accident shortly after it happens, when it is apparent that their assistance is needed.

(1) The stop should be made well off the traveled portion of the highway, so that his vehicle does not interfere with traffic or constitute a hazard. (Precise distance will vary with conditions and the state law.)
(2) At night, conditions may warrant stopping behind the wreckage to illuminate the scene with headlights.

d. Whether your vehicle is involved in the accident or not, avoid parking your vehicle on the left side of the highway, because it may confuse oncoming traffic.

e. To help prevent fire turn off the ignition of any vehicle involved in a collision.

f. If there appears to be adequate assistance at an accident scene, then continue on because to stop may create an additional hazard.

3.2 Marking and controlling an accident scene helps to prevent a single accident from turning into a multiple accident.

a. Smoking should be prohibited at the scene of an accident because of the danger of fire or explosion caused by gasoline being ignited.

b. At night, flares, reflectors, flashlights or some other warning device should be used to control oncoming traffic from both directions. (Position at least 400 feet from the scene.)

c. In the daytime, the accident scene also needs to be protected, particularly if it occurs near a hill crest, sharp corner or bridge.

d. Deciding whether first to set out signal devices or to assist the injured will depend upon the location and the nature of the accident, severity of injury and availability of assistance.

e. Bystanders must be kept well away from the roadway, unless they can perform some useful and necessary service.

3.3 Your first duty, after stopping your car, is to check for injured persons and summon assistance if necessary. Do whatever appears necessary under the circumstances to relieve suffering.

a. Make sure the injured person is confortable, but do not move him unless you are sure of correct first aid procedures.
(1) Good intentions on your part may result in further injury to the person.
(2) There may be a case where moving the victim is the better alternative.
(3) Do not attempt to move people who are trapped by the steering wheel or some other part of the vehicle. Perhaps you can relieve the pressure somewhat by adjusting the seat to extreme rear position.

b. In assisting the injured, one must not step over the boundary of first aid and into the area of treatment.
(1) First aid is the immediate and temporary care of the victim of an injury until the services of a physician can be obtained.
(2) Treatment may be performed only by a licensed physician. Applying medication; administering alcoholic beverage; using pain pills; setting a broken bone are examples of treatment.

c. Proper application of pressure directly to the wound and at pressure points is almost always effective in controlling bleeding, a common occurrence in traffic accidents.

d. If sterile compresses are not available, the inside folds of a handkerchief, towel or item of clothing may have to be applied directly over the wound.

e. Shock, another frequent condition among traffic accident victims, can be alleviated by:

   (1) placing the victim in a prone position with feet slightly elevated, except in the cases of internal injuries or severe head injury;
   (2) restoring or maintaining body temperature by placing material under the victim as well as on top; and
   (3) attempting to comfort and reassure the person that help is on the way, and that everything will be taken care of (family, luggage, etc.).

f. First aid treatment for fracture should be limited to immobilizing the broken limb and treating for shock.

g. A dry pack or wrap of four or five layers of clean muslin or cloth will reduce pain in the case of severe burns, by preventing air from striking the burned area.

h. Doctors prefer that no liquids be given to injured accident victims.

i. Respect religious beliefs if a person refuses aid or orders you not to give assistance to a family member.

j. If a number of people are available, a call for assistance can be made concurrently with the steps in aiding the injured.

   (1) Call should be made directly to the law enforcement agency that has jurisdiction in the area where the accident took place. They will summon other needed services, such as ambulance, doctor and wrecker.
   (2) The message should include the important points relative to the nature and location of the accident. (Let them hang up first!)

3.4 If you are involved in the accident, what you say and do at the scene may be very important in the follow-up to the accident.

a. Do not argue, accuse anyone, sign any papers or admit that you were wrong. (Hastly emotional admissions can be costly.)

b. Cooperate with the police officer by advising him of the basic facts briefly.

c. Exchange information with the other operators regarding name, addresses, vehicle registration and driver's license.

d. If you strike an unattended vehicle: leave identification at the scene (name, address and telephone number), and copy the license number of the vehicle you struck so that you may trace the ownership of the car if necessary. Report the accident to appropriate law enforcement authorities to protect you from a charge of "leaving the accident scene without properly identifying yourself."

e. Obtain names and addresses of witnesses and attempt to obtain from them a signed statement to what happened. If you witness an accident or are first on the scene, leave your name and address with the drivers who may need you as a witness.

f. Make written notes at the scene in order that a complete report can be made, and have the information verified by the police. Include information on:

   (1) time, date and exact location, direction of vehicles prior to impact, location of vehicles afterward, length of skid marks and other relevant information;
   (2) condition of road surface and weather;
   (3) names and addresses of all those in the other car, noting any who may be injured, sick, intoxicated or physically impaired; and
   (4) any attempts by the other driver to cover up his vehicle or personal deficiencies.

g. Unless your injuries impel you to do otherwise, do not leave the scene of the accident until you have, as previously indicated, assisted the injured, protected the scene, called an officer and assisted him, identified the other driver(s) and vehicle owner, obtained the names, addresses and statements of all witnesses, and made notes and diagrams to help you fill out the accident forms.

3.5 The proper method and timely filing of a formal accident report tends to reduce the possibility of legal and financial entanglements following an accident.

a. State laws and municipal ordinances vary as to what traffic accidents should be reported and to whom, but one safe rule is ***when in doubt, report the accident.***

b. After being involved in an automobile collision notify promptly, the nearest available representative of your insurance company for instructions.

Failure to file a prompt report with your insurance company may void your insurance.

c. State law requires that a written report be sent to the motor vehicle department within a certain time period of all personal injury accidents and all property damage accidents above a certain amount. Some counties and municipalities also require a report.

d. Accident report forms can be obtained from motor vehicle departments, police departments, insurance companies, or from the officer investigating the accident.

e. Accident reports must be made regardless of whether the accident was investigated.

f. The accident report form should be filled out completely and accurately, in order that your interests will be protected.

g. A list of questions regarding the information needed to fill out an accident report form (or copy of the form itself) carried in the glove compartment will serve as a valuable reference at the accident scene.

h. Request a photostatic copy of the accident report prepared by the policeman who investigated the accident.

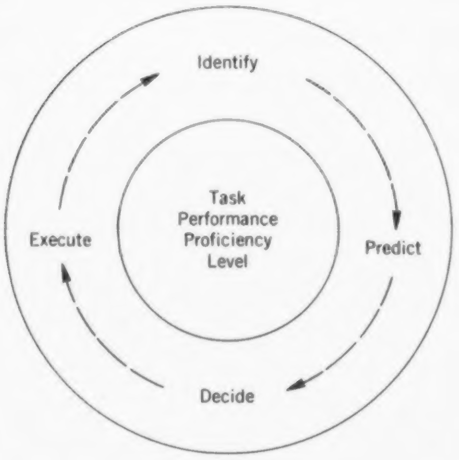
3.6 Advance planning of emergency communications, transportation and medical services reduces the number of deaths and severity of injuries from motor vehicle accidents (loss limiting factor).

a. When accidents occur, it is essential that every available resource be mobilized to save lives, lessen the severity of injuries, protect property and restore movement of traffic.

b. The Highway Safety Act reflects the importance of emergency medical services by requiring each state in cooperation with its local subdivision, to establish a program that meets standards related to:

(1) training, licensing and related requirements for ambulance drivers and attendants;
(2) types and number of emergency vehicles, including supplies and equipment;
(3) coordination of ambulance and other emergency systems; and
(4) evaluation.

c. Plans are underway to study and apply to our highway injured some of the efficient methods demonstrated by the military in evacuating battle casualties (helicopter ambulances).



Section – I

Episode Delineation Form

UNIT D Title: Controlling The Consequences Of Highway Collisions
EPISODE 4.0 Title: Financial Responsibility

EPISODE PURPOSE: Insurance is a vital factor in safeguarding the future of highway users, their families and property. Regardless of an operator's own skill and ability, there is no guarantee that he will avoid all collisions. Every operator must be prepared to face the consequences of collision involvement. Legal complications, human suffering, time loss, inconvenience and expense can result from a collision, regardless of who is at fault. Type and amount of motor vehicle insurance the owner carries is an individual decision, with the exceptions of compulsory insurance and financial responsibility laws of some states.

This episode will help students to acquire information needed to make intelligent decisions regarding the reduction of highway collision consequences through insurance.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
4.1	Nature of Insurance	Relate the basic principle of insurance to that of reducing the consequences of traffic collisions.	Teacher–directed discussion of various types of insurance–life, medical, homeowner, etc.–would draw out the basic principle of insurance: spreading of risk. This could then be related to motor vehicle insurance.
4.2	Liability	Define liability, negligence and judgment. In addition, construct a situation which would point out the values of motor vehicle insurance with respect to liability.	A simple one-car accident illustrating negligence is described. From this illustration other components could be brought in which would complicate total negligence such as another car, yield sign or chuck holes. Students then would be asked to state why liability insurance would or would not be beneficial in each case.
4.3	Liability Insurance	Determine if the amount of liability insurance is adequate when given the amount of judgment awarded to a plaintiff from civil action growing out of an automobile accident and the amount of insurance carried by the defendent.	A handout giving a brief description of each type of insurance is distributed as the episode progresses. A space is provided for the students to supply the insurance type nomenclature. The spaces are completed as the discussion progresses. After all types are discussed, an earlier collision situation would be recalled and negligence established. The amount and type of insurance of each owner involved would be stated and each student would analyze the facts to determine what costs would be paid by each person involved.
4.4	Physical Damage Insurance	Identify and distinguish between damages claimable under collision insurance coverage and comprehensive auto insurance coverage.	
4.5	Special Insurance Coverage	Summarize the benefits of medical payment insurance, road service insurance and uninsured motorist protection. Identify the value of a financial responsibility law and explain how to satisfy the requirements of such a law when unable to obtain insurance through routine procedures.	
4.6	Factors Influencing Insurance Premiums	Identify the factors which influence premium rates.	A couple of selected students would visit a local insurance agent and discuss the cost of a typical insurance policy. The findings could be reported back through various methods (i.e., tape recorder, one student playing role of agent and other of a beginning driver desiring insurance cost information). Emphasis should be placed on ways premiums can be lowered by the young driver.
4.7	Young Driver Rates	Identify reasons for higher insurance rates among young drivers and means of keeping those rates to a minimum.	

CONTENT

4.0 Insurance is a way for motor vehicle owners to protect themselves and others from financial losses due to negligence or other action having to do with motor vehicles.

4.1 The basic principle of insurance is spreading of risk.

a. All people who are insured are helping to pay for each other's losses.

b. Insurance is an old institution with an adventurous history - started when owners of sea-going vessels pooled resources to protect the individual owner who lost a ship.

c. An insurance policy is really a set of policies covering liability, physical damage and special types of insurance.

4.2 A person causing injury or damage to another person's self or property is liable for his actions (a legal obligation).

a. As an operator, you can be held responsible in both criminal and civil actions.

   (1) Criminal responsibility is between you and the State - if you are convicted of a traffic violation, you are punished with a fine or a jail sentence.
   (2) Civil responsibility is between you and the person who has been injured or whose property has been damaged - he can sue you for damages, even if there has been no violation of criminal law.

b. Negligence is the key to whether or not a person is declared liable for damages to another individual's person or property.

   (1) A person is negligent when he has failed to act as a reasonable and prudent person would act under the circumstances. (Could be error of commission or ommission.)
   (2) In other words *negligence* is any conduct which falls below the standard established by law for the protection of others against reasonable risk of harm.
   (3) Right-of-way and negligence should not be confused. You can be guilty of contributory negligence when you strike a vehicle that went through a red light. Operators have a legal and moral responsibility to avoid conflict with other highway users, despite apparent wrong actions of others.

c. If a court finds one driver *all* to blame for an accident, it will order him to pay the victim for his losses. (Judgment)

d. Liability insurance pays for judgments against you, *within the limits of the policy*. If the judgment is more than the policy limit, you must pay the excess.

e. In most states, if the court finds that both operators contributed to the accident, no matter what the ratio of fault might be, no one collects under anyone's liability insurance coverage. (Some states have comparative negligence.)

4.3 Liability insurance furnishes protection in case you are proved liable for accident damages or sued.

a. Bodily injury liability insurance protects you for the injuries your actions cause to another highway user.

   (1) A judgment for bodily injury damages could include hospital and doctor bills, loss of wages, and pain and suffering. (The last item could be the largest.)
   (2) Bodily injury insurance has two limits - a limit for each *person* and a limit for each *accident*. (Usually sold in blocks of thousands, like 10/20, 20/40, 50/100, etc.)
   (3) Besides paying judgments for you, bodily injury liability will pay for lawyers and court costs to defend you against a suit when the accident was not your fault.

b. Property damage liability insurance (P.D.L.) protects you for the damage you and your car does to the property of other persons.

   (1) The property can be another car, a house, a telephone pole, a tree, a fire hydrant.
   (2) P.D.L. works the same as bodily injury insurance - you must be *all* to blame or your company doesn't pay the other fellow.
   (3) This type of insurance is usually sold in blocks of $1,000, with $5,000 being the lowest sold in most states.

c. Liability insurance is the most important motor vehicle insurance coverage.

   (1) If we hurt someone or damage his property the amount that he could collect could be huge.

(2) If we cannot satisfy a judgment the court may sell our real estate and personal property or take it our of our wages until the judgment is paid (garnishment).
(3) Your operators license will be suspended until judgment is satisfied or you are released by other party.
(4) By protecting yourself, you protect the other fellow too - you've got insurance to pay him for what you did.

d. Liability insurance protects the owner of the vehicle ("named insured") plus all members of his household and anyone else who has *permission* to drive the car.

(1) Also protects the "named insured" and his family while driving a car which belongs to someone else.
(2) The "named insured" is also protected if someone outside the family drives his car with permission and hurts someone or damages someone's property.
(3) A son or daughter with permission to drive the family car does *not* have authority to give others permission to drive. (Only the "named insured" can grant permission.)
(4) To be on the safe side, always get permission to drive anybody's vehicle; be sure that your driver's license is in order: and never use your car for racing or other illegal purpose or permit anyone else to so use it.

4.4 Physical damage insurance is designed to compensate you for certain losses caused to your vehicle and/or property.

a. *Collision insurance* pays for damages to the policyholder's vehicle caused by collision or upset.

(1) Protects *your* vehicle against the damage you or others might do to it while it is being operated.
(2) We may be in an accident where the other operator was not all to blame.
(3) We can run off the road and damage our vehicle without any other operator being involved.
(4) Collision insurance is usually sold on a "deductible" plan which can be purchased in varying amounts, but the lower the deductible amount the higher the premium. The insurance company pays for the repairs over the deductible amount.
(5) Collision protection insures your vehicle for the actual cash value at the time of the loss which could be less than its replacement cost. Actual cash value is its replacement cost new less its depreciation. (Depreciation applies to partial losses as well as total losses.)
(6) Your insurance agent may advise you to drop collision insurance when your vehicle reaches a certain age and has a low cash value.
(7) Following an accident, discuss with your agent your rights and privileges under the terms of collision insurance before you proceed to have your car repaired.

b. *Comprehensive auto insurance* pays for damage to the policyholder's vehicle caused by something other than a collision or upset.

(1) Comprehensive protection covers your vehicle against direct and accidental loss or damage, regardless of what caused the damage (except for collision or upset).
(2) Hazards covered include fire, missiles, falling objects, larceny, explosion, earthquake, windstorm, hail, water, flood, malicious mischief, or vandalism, riot and civil commotion and actual contact with an animal.
(3) The vehicle owner can purchase just certain kinds of physical damage protection, but most people prefer the total package known as "Comprehensive."

4.5 There are many additional types of insurance that fall into the special coverage category which have special value in certain situations.

a. *Medical payments* insurance covers medical and funeral expenses, up to policy limits, for the policyholder and others injured or killed while riding in his car.

(1) This insurance pays regardless of who caused the accident, but will not if the other driver is totally liable.
(2) The protection begins when you start to get in the car and is in force until you get out.
(3) Extended medical payments insurance, available from most companies, covers the policyholder and his family when hurt in or by other vehicles when not in their own car (includes pedestrian and bicycles).
(4) The smallest amount of medical payments protection is usually $500 and the largest $5,000. It costs very little more to purchase $2,000 protection as opposed to $500.
(5) Medical payments insurance is really accident insurance.

b. *Road service* insurance pays towing charges if the policyholder's vehicle breaks down on the road.

(1) This protection pays what it takes to help you, but usually not more than $10 to $25.

(2) It does not pay for repairs to your vehicle, unless performed at the scene of disablement.

c. *Uninsured motorist protection* protects the policyholder, his family and other passengers in his car from bodily injury losses caused by an uninsured or hit-and-run driver who is legally liable for the damages.

(1) If you are involved in an accident with a person who does not have any liability insurance, even though the accident is *all* his fault you may have to assume your costs from the accident.

(2) Uninsured motorist protection does for you what *bodily injury insurance* would have done if the other fellow had bought it ($10,000-$20,000 limit).

(3) Uninsured motorist insurance pays you only what you were legally entitled to get but couldn't collect because the driver to blame was not insured.

(4) A number of states have a financial responsibility law to help protect the public from the uninsured motorist. Under this law, if you are involved in an accident and do not have insurance, you will be required to put up a cash bond with the state treasurer to show that you are a financially responsible person. If you do not have insurance and do not put up the cash bond, your operator's license and plates are automatically revoked, regardless of fault. This law also sets minimum liability coverages which may be sold in that state.

(5) A few states have a compulsory insurance law which changes the concept of insurance to protection of the public rather than the individual.

d. Automobile Insurance Plans (formerly known as assigned risk plans) are placement services developed by the insurance industry to help persons who have difficulty finding an auto liability insurer.

(1) All of the auto insurers in a state agree to accept a share of the referrals made by these service facilities.

(2) Under improved plans, when a company insures male drivers under age 25 through its regular underwriting procedures, its quota of referrals from this plan is reduced.

4.6 Many factors influence premiums for vehicle insurance.

a. The way you and the other people in your city, county and state drive has a lot to do with how much you pay.

(1) Accident experience in a region is a major factor in determining rates. Without accidents there would be no injuries, repairs or damages for the insurance company to meet, and the individual to pay through higher premiums.

(2) Based on the accident experience of various groups or classes of drivers, insurance companies have devised rating scales for setting premium rates (age, sex, type of car, occupation, type of driving, where the car is garaged, and the previous driving records of vehicle's principal drivers).

(3) Some companies use merit rating–a plan which reduces the cost of insurance when there are no accidents but increases the cost for each accident.

(4) One accident, whether or not you are legally at fault, can increase on a $150.00 insurance premium by 100% or more.

(5) As a practical matter it is not possible for an insurance company to devise an individual rate for each motorist.

b. The cost of repairs, a determinant of automobile insurance premiums, is influenced by:

(1) rising costs of labor and replacement parts for vehicles;

(2) the *integrity* of vehicle owners involved in accidents and the garage mechanics who repair the vehicle (those who pad repair bills are cheating the policyholders who do not cheat); and

(3) fake claims.

c. The number of court judgments also influences vehicle insurance premiums.

(1) Many cases are settled out of court, but of those that are tried some result in judgments in the hundreds of thousands of dollars. (All policyholders help to pay this.)

(2) To get more accident victims paid quickly and equitably, and to eliminate many of the irritants and controversy associated with the present system, various experimental plans are being conceived and tried.

d. Insurance companies are closely regulated by state insurance departments, and this regulation includes approving or not approving the rates each company wants to charge.

4.7 Young drivers, as a group, are involved in more than their share of accidents. This is reflected in the insurance premiums for them.

a. When parents simply let their son or daughter drive the family car, they can insure them as an occasional driver under their own policy.

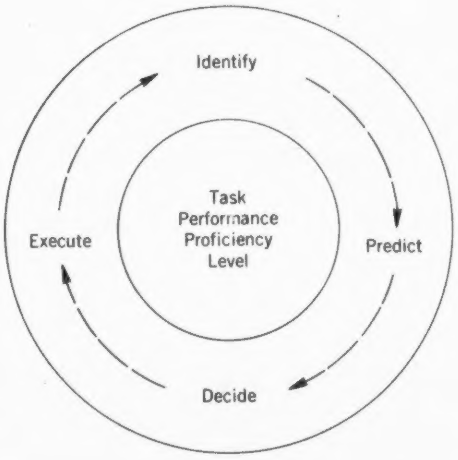
b. After a few years of good driving experience in the family car, young drivers usually can obtain coverages on a vehicle of their own without difficulty.

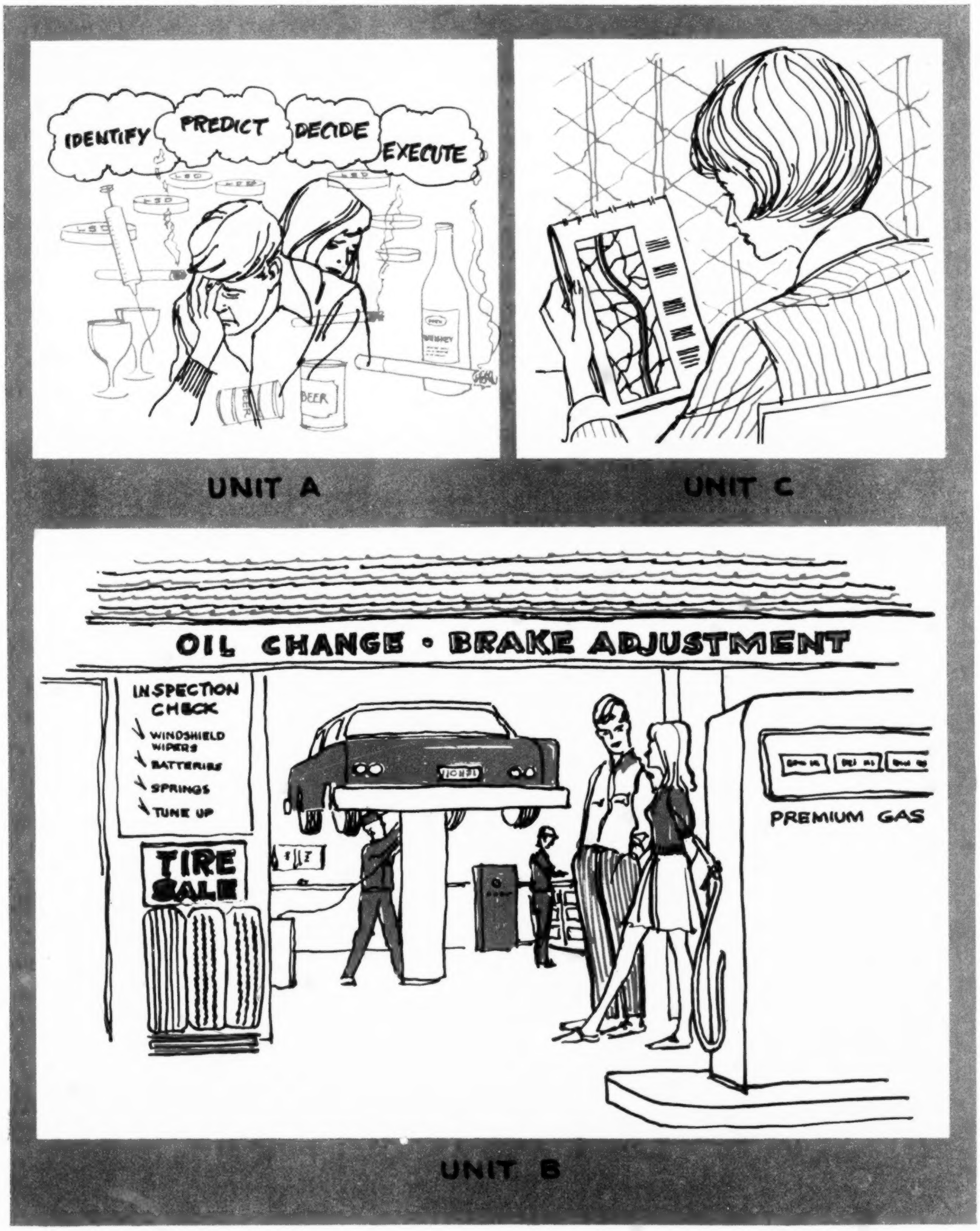
c. If the young person is given or allowed to purchase a vehicle of his own at age 16 or 17, he will have some difficulty obtaining insurance.

d. Many insurance companies have refined their rate classifications for male drivers under 25 and female drivers under 21 to provide a better matching of premiums and loss expense, making young drivers more insurable. (Some companies are using psychological tests in an effort to make insurance more readily available to young operators who are mature in their driving attitudes.)

e. Some insurance companies provide a reduction in auto insurance premiums for students with an A and B grade average or the equivalent. This plan is based on the assumptions that:
   (1) high achievers in school display a degree of maturity and conscientiousness which is bound to affect their driving habits favorably, and
   (2) the successful student must spend considerable time studying, and consequently less time on the highway.

f. Many insurance companies offer lower premiums to drivers under 25 who have successfully completed an approved driver education course.

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UNIT C
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INSPECTION CHECK
WINDSHIELD WIPERS
BATTERIES
SPRINGS
TUNE UP
TIRE SALE
PREMIUM GAS
UNIT B

SECTION II – READINESS TASKS

Section Goal:

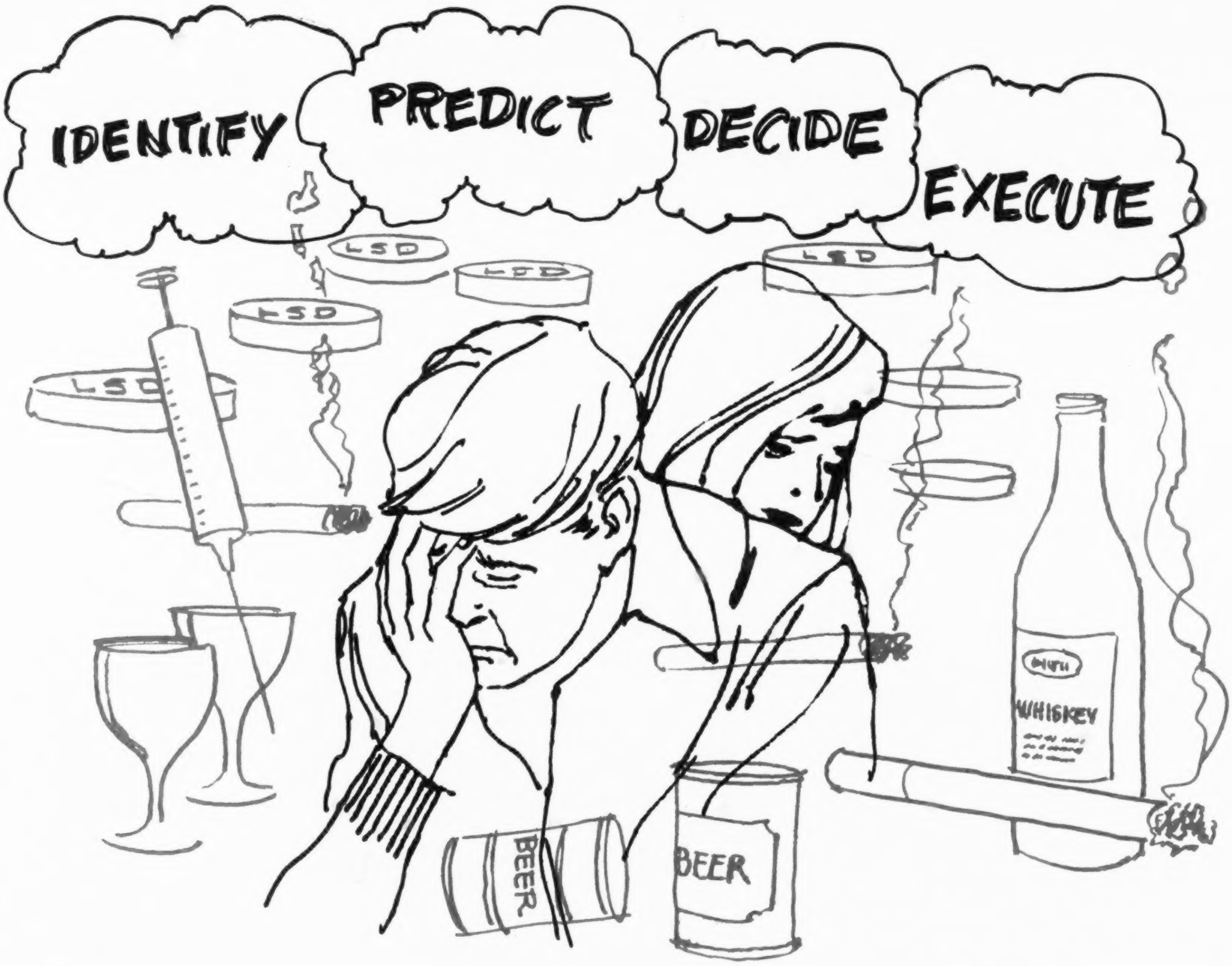
Students will be able to determine personal fitness and vehicle readiness for a trip, and plan a trip within the capabilities of both.

Unit Titles:

A. Operator Fitness

B. Vehicle Readiness

C. Trip Plan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Unit A - Operator Fitness

Unit Objective:

Students will be able (1) to identify and appraise physical, physiological, mental and psychological factors that influence the behavior of highway users; and (2) to determine appropriate courses of action to minimize the hazard caused by these factors.

Episode Titles:

1.0 Alcohol
2.0 Drugs
3.0 Emotions and Motivations
4.0 Fatigue and Carbon Monoxide
5.0 Other Impairments

Episode Delineation Form

UNIT A Title: Operator Fitness

EPISODE 1.0 Title: Alcohol

EPISODE PURPOSE: Much is yet to be learned about underlying causes of traffic accidents, but the evidence is clear that alcohol is a frequent contributing factor, particularly in severe crashes.

The proposed learning episode is designed to help young people to (1) acquire accurate information about the problem, (2) examine and clarify their feelings and attitudes toward drinking and driving, (3) develop a realistic plan for handling social situations involving alcohol and driving, and (4) recognize the need for effective legislation and enforcement.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
1.1	Absorption, Distribution, and Oxidation	Describe what happens to alcohol in the body from the time it is first ingested until it is eliminated.	
1.2	Effect on Body Functions	Given a list of body functions (speech, vision, judgment, coordination, etc.) in random order, arrange them in the sequence these functions would be impaired by increasing amounts of blood alcohol concentration.	
1.3	Variables	Identify (1) individual differences which determine the manner and degree with which people are influenced by alcohol and (2) the conditions which cause the same individual to be affected more at one time than another.	
1.4	Influence on Driving Performance	Describe the effects of alcohol on the human functions involved in driving (identify, predict, decide and act), in the order that these effects are likely to occur as the concentration level of alcohol increases. In addition, explain why these effects are likely to be more pronounced in young people than in adults.	
1.5	Motivations-Decision	Identify and appraise motivations that prompt young people to drink, and develop personal guidelines for behavior that will minimize the risks associated with drinking and driving.	
1.6	Accident Data	Compare the probability of problem drinkers and social drinkers being involved in highway collisions.	
1.7	Legislation and Enforcement	Assess the potential of legislation and enforcement measures for reducing alcohol induced highway accidents.	

CONTENT

1.0 Ethyl alcohol, found in several commonly consumed alcoholic beverages, impairs the human functions involved in operating a motor vehicle.

1.1 When ingested, alcohol is directly and quickly absorbed into the bloodstream through the lining of the digestive tract, carried by the blood to all parts of the body (including the brain), and finally oxidized or eliminated.

a. Alcohol does not have to be digested slowly, as most other foods must be, before reaching the blood stream.

b. The rate at which alcohol enters the blood stream through the walls of the stomach and small intestine depends upon the:

(1) rate at which alcohol is ingested;
(2) total amount of alcohol involved;
(3) other components of the drink – straight liquor is absorbed fastest of all; liquor diluted with water is absorbed most slowly; and

(4) the characteristics and amounts of other foods and beverages also present in the stomach.

c. Alcohol is carried by the blood to all body tissues and distributed in proportion to the water content of the body material. (Weight of the person is a significant variable.)

d. Alcohol cannot be stored in the body for any length of time like some foods, but instead is circulated throughout the body until it is oxidized or eliminated.

(1) Oxidation is a series of chemical changes that enables food to release energy.
(2) Most oxidation takes place in the liver, which needs about 1 hour to burn up 1/2 ounce of pure alcohol.
(3) A small percentage (5 to 10 percent) of the alcohol is eliminated by the kidneys, breath and sweat glands.

e. How much alcohol reaches the brain at one time is determined by how much the person drinks, and how closely spaced those drinks are.

f. When the consumption of alcohol and its absorption in the body is faster than the oxidation rate, alcohol and its effects will "pile up".

g. The concentration or percent of alcohol in the blood at any given time can be measured accurately by blood, breath or urine analysis, but a rough guide for a 150-pound person is that each drink increases the concentration of alcohol in the blood by 0.02 percent.

(1) The average drink of whiskey (1 ounce), wine (3 1/2 ounces), and beer (12 ounces) all contain about one ounce of alcohol.
(2) Liquors (rum, gin, vodka, brandy and whiskey) contain 40 to 50 percent alcohol; dessert or cocktail wines (ports and sherries)-18 to 21 percent, ordinary table wines-up to 14 percent; and beer 4 percent.

1.2 As the alcohol concentration in the blood stream builds up, body functions are affected.

a. In spite of deceptive outward signs (flushed face, animated behavior, etc.), alcohol operates as an anesthetic by deadening the nerve centers, and therefore is identified as a *physiological depressant.*

(1) A person may feel gay and pepped up, nevertheless, the nervous system is being *depressed,* not stimulated.
(2) Alcohol does not "step on the gas" for us (stimulant), it simply paralyzes the brakes (restraints).

b. Alcohol's paralyzing, numbing effect on the brain begins at the higher center (cerebrum) and moves toward the lower center (medulla) of activity, as the concentration of alcohol in the blood stream increases. (The parts of the brain are affected in reverse order of their development.)

(1) First, the forelobes (cerebrum) of the brain are affected, resulting in decreased ability to reason and make judgments, weakened social inhibitions, and changed attitudes toward others.
(2) As the concentration increases, more of the forebrain is affected and, in addition, alcohol reaches the cerebellum which controls sensory-motor functions. The result is emotional instability, retarded responses, impaired vision and uncoordination.
(3) At higher levels of concentration the person is unable to stand or walk, and then loses consciousness. Death results when all of the brain, the upper spinal column, the respiratory and heart control centers are anesthetized.

c. The effects of alcohol increase approximately as the square of the blood alcohol concentration. (0.08 percent concentration is not twice as bad as 0.04 percent, but instead four times as bad.)

1.3 Inherent, acquired and other factors cause differences in the manner and degree with which people are affected by alcohol.

a. Body weight, body chemistry, attitude toward drinking and drinking experience cause individual differences.

b. Fatigue, emotional state, food intake and drugs cause the same individual to be affected by alcohol more at one time than another. Some drugs when combined with alcohol produce effects that exceed the sums of the separate effects of each.

c. Aspirin, black coffee, cold showers and exercise have little influence in reversing the principal effects of alcohol.

1.4 All of the capabilities required to operate a motor vehicle are particularly susceptible to the effects of alcohol (identifying, predicting, deciding and executing).

a. The driving ability of most persons becomes impaired *before* they display *outward* signs of motor impairment, and other noticeable effects.

b. The insidious effect of alcohol on judgment and self control, even in the early stages, is particularly serious.

(1) Since self-criticism is affected early, the drinker often is unlikely to recognize any change in his behavior.
(2) Even more serious is the likelihood that he feels more perceptive and skillful, and, therefore, is likely to take more chances in passing, speeding or negotiating curves (self-confidence increases as skill decreases–the worst possible combination).

c. Reduced input of sensory data (effect on vision) plus diminished ability to identify and analyze the data which is absorbed (effect on reasoning center) combine to impair the driver's decision-making ability.

d. Responses are slowed and muscular coordination impaired due to alcohol's effect on the nerves which control the muscles. This could make a critical difference in stopping distance and the ability to manuever the vehicle.

e. Those who have been drinking, especially heavily, are probably far less likely to follow sensible safety practices, such as, signalling intentions, fastening seat belts and other normal precautions.

f. Some individuals drive time and again after drinking and do not have an accident, reinforcing their belief (misconception) that alcohol does not lead to greater danger on the highway.

g. Even though some individuals, after a few drinks, exceed the driving competence of other persons who have not consumed any alcohol, it behooves everyone to be at his optimum performance level when driving.

h. Alcohol is likely to affect driving performance of young drivers more than adults.

(1) The young person who drinks lacks experience in compensating for the effects of alcohol.
(2) The young driver is an inexperienced driver, hence his skills are less automatic and more inclined to deteriorate from alcohol's effect.
(3) Risk taking, especially strong in young people, may be accentuated by alcohol.
(4) On the average, the body weight of young people is less than adults.

1.5 Most young people drive and some young people drink, and the same individual will sometimes do both. (*What will you do?*)

a. An important part of the problem occurs when young people leave the social setting where drinking usually occurs and head for home or another social setting. (To be free of parents and the law, young people sometimes drink in automobiles.)

b. Various motivations prompt people (including youth) to drink, such as:

(1) *social pressures*–faced with the alternatives of being a good social "citizen" and drinking, or being a good traffic "citizen" and not drinking;
(2) *self-enhancement*–to demonstrate "maturity", adulthood;
(3) *curiosity and experimentation;*
(4) *desire to relax and relieve anxieties or to celebrate a special occasion;* and
(5) *family custom.*

c. The responsible course of action in regard to drinking and driving is to:

(1) acquire accurate information about the effects of alcohol;
(2) analyze one's attitudes and feelings concerning the matter;

(3) develop strategies (mental sets) for handling social situations where drinking and driving is or could be involved.

d. The most intelligent alternative is to avoid the combination of drinking and driving, because the "gain" is not commensurate to the risk involved.

1.6 The immoderate use of alcohol is a major source of highway crashes, especially of those most violent.

a. Alcohol contributes to about half of all highway deaths (higher in single-car fatalities), and to an appreciable percentage of the far more numerous non-fatal crashes.

(1) As the severity of the accident increases, the probability of alcohol being a contributing factor also increases.
(2) Fatal and other crashes of teenagers and young adults frequently involve hazardous amounts of alcohol.

b. Alcoholics and other problem drinkers, who constitute but a small minority of the general population, account for a very large part of the overall problem.

e. The social drinker-driver is dangerous because:

(1) of sheer numbers;
(2) they are not so easy to spot and defend against;
(3) they fail to recognize their limitations.

f. The probability of being in a crash increases sharply, as the amount of alcohol in the blood increases.

(1) There is a difference of opinion between experts as to the extent of crash likelihood in a blood alcohol content below 0.05 percent.
(2) Evidence is clear that the likelihood of crash involvement increases at about 0.05 percent level and becomes progressively and disproportionately higher at higher concentrations.
(3) The higher a driver's blood alcohol concentration, (a) the disproportionately greater is the likelihood he will crash; (b) the greater the likelihood that he himself will have initiated any crash in which he is involved; and (c) the greater is the likelihood that the crash will have been severe.

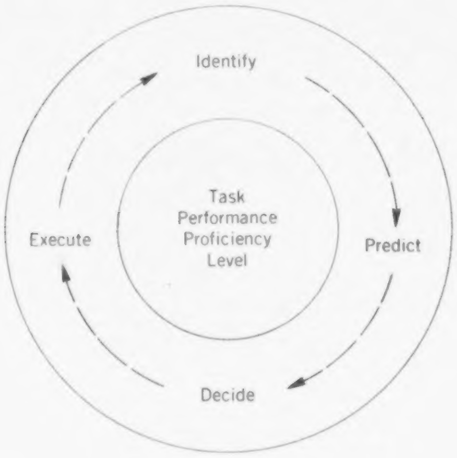
g. The association between blood alcohol levels and pedestrian accidents very closely parallels the findings in the studies of drivers (limited evidence).

1.7 Evidence supports the need for effective legislation and enforcement action to reduce the probability of alcohol induced highway accidents.

a. A vehicle on the highway is no longer an individual responsibility, it is also a community responsibility. The impaired driver is a threat, not only to himself, but also to all those with whom he interacts on the highway.

b. All states have adopted legislation designed to control the drinking and driving problem. (These laws differ, so state laws should be identified.)

c. The most effective combination of enforcement and education will be one that preconditions the individual to set limits on his drinking and driving behavior even before he takes his first drink.



Episode Delineation Form

UNIT A Title: Operator Fitness

EPISODE 2.0 Title: Drugs

EPISODE PURPOSE: Drug use and abuse is increasing at an alarming rate, and the people involved are driving motor vehicles. Some of these individuals fail to understand the drug-driving hazard, while others possess the knowledge and decide to assume the risk. In any case, the problem is a challenge to the educational process, and driver education offers an excellent opportunity to inform young people about the effects and possible consequences of combining drugs with driving. This episode responds to that challenge.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
2.1	General Types	Define the two general types of drugs (prescription and non-prescription) and indicate how either type can be a factor in highway safety.	
2.2	Drugs and Medicines	Classify specific kinds of drugs, their effects on body functions, and possible consequences for the motor vehicle operator.	
2.3	Guidelines	Formulate a set of personal guidelines for avoiding harmful highway consequences from drug misuse.	

CONTENT

2.0 Drugs and Driving Do *Not* Mix.

2.1 There are two general types of drugs.

a. Some drugs may be sold over the counter without a prescription from a physician.

(1) These drugs are required by law to bear "adequate directions for use". If used with the frequency and in the amounts stated in these directions, there is no danger in driving a motor vehicle.

(2) Do not think that because one tablet helps, two tablets will be more helpful. Two tablets could affect the nervous system, reduce your alertness and impair driving performance.

(3) A common drug, such as aspirin, can be fatal if ingested in large numbers (have been used to commit suicide).

b. Another group of drugs can be dispensed only on a doctor's prescription.

(1) The doctor indicates directions for use to you or the druggist. These directions should be followed exactly, not only to accomplish their purpose, but also to prevent dangerous side effects.

(2) The brain is the first organ in the body affected by drugs used in excess of directions. Ability to function, to be alert, to see and prevent dangers is often destroyed.

2.2 Different drugs have different effects on body functions - all detrimental to *driving* performance.

a. Narcotics (morphine, cocaine and heroin) are the most powerful and dangerous form of drugs.

(1) In extreme cases, they are prescribed by a physician to relieve pain in disease, trauma and burns.

(2) They have a depressant effect on the central nervous system which produces drowsiness, inability to concentrate, impaired vision, and sluggishness, but at the same time they provide a feeling of well being (euphoria) or apathy.

(3) Usually narcotics are habit forming and furthermore, when the supply is cut off, serious and painful withdrawal symptoms may develop.

(4) Drug addicts also drive automobiles, and the hazards are rather obvious.

b. Marijuana ("reefers", "pot", "loco weed"), a natural drug rolled in cigarette paper and smoked, produces effects in the user particularly dangerous when operating a motor vehicle.

(1) In the early stages, the user may appear animated and hysterical, while in the later stages sleepiness and stupor result.

(2) A person who becomes psychologically dependent and takes a heavy dosage may experience hallucinations–and the mood may swing from joy to extreme fear, or panic.

(3) Marijuana intoxication does not impair motor coordination so rapidly, so a user may operate a car while his *concepts of time and space (depth perception) are radically distorted.*

c. Amphetamines ("bennies," "pep pills," "co-pilots") are useful in treating certain illnesses and for controlling obesity, when used under medical supervision, but when carelessly used can be a threat to highway safety.

(1) They have a stimulating effect on the nervous system, increasing alertness and efficiency for a short time.

(2) Temporary effect may be followed by headache, dizziness, irritability, decreased ability to concentrate, and marked fatigue.

(3) Operators may see things in the road that are not really there–mirages or hallucinations.

(4) Operators need to consider that excessive unsupervised use interferes with the body's normal protective symptoms of drowsiness and fatigue (feeling of exhaustion is short circuited), causing the drivers to use up the reserve of body energy until a total and sudden collapse may occur.

(5) Legally, amphetamines can be sold only in drug stores, upon a doctor's prescription, but they are "bootlegged" and sold for enormous profit to truck drivers and young persons to keep awake.

d. Barbiturates (sleeping pills, "goof balls," "candy," "barbs," etc.) are useful medicines to calm nervousness and produce sleep in persons with medical problems. However, uncontrolled use can lead to serious consequences.

(1) They are habit forming and sometimes lead to addiction to true narcotics; therefore, they may not be sold legally without prescription (pushed by underworld peddlers for this reason).

(2) The natural tolerance for barbiturates varies from one person to another (greater tolerance does not preclude addiction).
(3) Excessive use produces symptoms similar in some respects to alcoholic intoxication (drowsiness, confusion, inability to coordinate muscular actions, difficulty in thinking or talking clearly).
(4) Even the occasional user will become drowsy and less alert. This reduces the drivers' ability to identify, predict, decide and act.
(5) They should never be used except under a doctor's instructions, and never while driving.

e. "Tranquilizer" identifies a group of preparations that are muscle relaxants, affecting some reflexes to relieve mental apprehension (attitude and outlook).

(1) Relatively mild compared to barbiturates but if excessive dosages are used repeatedly they can result in sedation to the point of dizziness, drowsiness and blurred vision.
(2) Physical dependence can develop if used excessively.
(3) Fall under the Federal prescription drug laws, although some preparations are compounded with other substances to contain a small amount of tranquilizer and sold without prescription.
(4) Even those sold over the counter, such as inhalers, may have such a depressant effect on the central nervous system that driving performance will be dangerously impaired.
(5) Particularly dangerous when used along with other drugs or alcohol (synergetic effects).

f. Antihistamines which are used for relief of nasal congestion due to colds, to combat allergies and for other purposes can also seriously impair one's ability to operate a motor vehicle.

(1) Have a depressant effect on the central nervous system.
(2) May cause side effects such as inattention, confusion and drowsiness.
(3) Effects vary from person to person and are rather unpredictable (one person feels nothing; one is overcome with the desire to sleep; and one suffers genuine hallucinations).
(4) Some preparations containing a quantity of antihistamines compounded with other substances may be sold without prescription (Contac, Dristan, etc. are examples).

g. A number of other drugs now available, and others being developed, need to be used intelligently or in some cases avoided entirely by highway users.

(1) Dramamine, a widely prescribed product for motion sickness, may cause drowsiness, dull mental alertness, and slow down reaction time.
(2) Penicillin and sulfanilamides may cause abnormal and violent reactions (Streptomycin particularly bad).
(3) Reducing preparations may cause dizziness and drowsiness.
(4) Glue sniffing produces immediate symptoms similar to those associated with alcohol intoxication, while a second stage produces drowsiness, stupor, or, in some cases, unconsciousness.
(5) LSD and other hallucinogens primarily affect the central nervous system, producing changes in mood and behavior, and upsetting the user's perception of reality (perceptual changes involve senses of sight, hearing, touch, body-image and time).

2.3 There is little scientific evidence as to the extent to which drugs and medicine (with the exception of alcohol) contribute to the prevention or cause of highway accidents, but simple analysis tells us that uncontrolled use can be harmful to the health of the user and make it unsafe for him to operate a motor vehicle.

a. Under medical supervision drugs are useful in treating certain illnesses, but about one-half of the millions of capsules and tablets manufactured annually are sold illegally (organized crime rings bootleg them).

b. The effect of drugs does not in itself cause automobile accidents, but they may cause a change in the physiological state of an individual that would impair him in his ability to safely operate a motor vehicle.

c. Some people use drugs for their "side effects" or for reasons other than their intended purposes. (Drivers use them to keep awake.)

d. The effect of drugs and alcohol in combination equals more than "one-plus-one", and this is true also of other combinations of drugs. (One drug intensifies the effects of the other in a synergetic effect.)

e. Drugs, like alcohol, first affect the higher brain and nerve centers which control reason, judgment, self-control, and normal inhibitions, and as a result render the person incapable of evaluating his fitness for driving.

f. What you do about drug use and driving is an individual matter, but the responsible person considers the consequences of misuse and avoids any combination of drugs and driving that cause a foolish risk to himself and others.

Episode Delineation Form

UNIT A Title: Operator Fitness

EPISODE 3.0 Title: Emotions And Motivations

EPISODE PURPOSE: How we respond to the traffic environment depends somewhat on the emotional state and preparation that we take with us to the driving task, along with the reason (motivation) for that particular mission. Furthermore, the driving environment is replete with frustrating situations which can induce strong emotions, such as, actions of other highway users, roadway factors, traffic laws and enforcement. In any case the driver needs to learn how to cope with these frustrations so that the frequency and strength of the disturbance is minimized. This episode is directed to that end.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
3.1	Emotions and Driving Behavior	Summarize the nature and effects of emotions on motor vehicle operators.	
3.2	Handling Emotions	Formulate personal guidelines for anticipating and handling situations likely to induce strong emotions and unsafe behavior.	
3.3	Motivations for Driving	(1) classify the needs operators try to satisfy on the highway (other than transportation); (2) indicate the type of behavior likely to be induced by these needs; and (3) suggest alternative means of satisfying the same needs that would be safer and more productive.	

CONTENT

3.0 Through self-discipline and self-control the operator can protect himself and others from the detrimental effects of strong emotions and inappropriate motivations for driving.

3.1 Emotions (fear, love, hate, anxiety, joy, excitement) have a profound effect on behavior in general and driving in particular.

a. A single emotion is a strong feeling of one sort or another typically involving both mental and physical responses.

(1) Emotions, like alcohol, affect the part of the brain which controls thought, reason and judgment (cerebrum).
(2) Strong emotions affect certain bodily changes: heart beats faster, face flushes, breathing speeds up, blood pressure rises and muscles become tense.
(3) Repeated extreme emotion may affect digestion and appetite, cause chemical changes, or lead to ulcers.

b. Most emotions are temporary, but emotional habits sometimes develop from our experiences, causing us to act the same way over and over again (temperament).

c. The mental state that the driver brings to the driving task frequently influences his performance. He may be:

(1) worried about an examination;
(2) depressed or elated about the outcome of an athletic contest;
(3) upset about an argument with a girl (boy) friend; or
(4) angry because of a restriction imposed by a parent or teacher.

d. The distracting and paralyzing effect of strong emotions, regardless of whether they originated before or during the trip, can:

(1) dim or "blind" our powers of observation;
(2) delay or distort our ability to interpret events;
(3) reduce our powers to assess and predict the actions of other highway users;
(4) produce faulty judgment and high risk decisions; and
(5) adversely affect ability to perform precise and properly timed skills.

e. Emotions are contagious and can influence others –you become angry, causing another driver to become angry, who in turn passes his anger on to someone else–setting up a chain reaction.

f. Emotions can be a positive force toward determining our driving behavior.

(1) Reasoned *fear* of an accident or legal punishment helps to restrain unsafe tendencies.
(2) *Love* that a person has for family and friends can motivate a person to drive safely.

g. There are no laws on controlling emotions, but laws do relate to certain behavior which results from uncontrolled emotions (speeding, failure to yield, etc.).

h. The development of the reasoning and emotional centers of the brain is a lifelong process, and young people are in the early stage of the development.

(1) Young people are inclined to be more erratic in temperament, more subject to extremes, and more likely to let their emotions drive the car.
(2) However, *emotional maturity is not necessarily related to chronological age.*

3.2 Accident potential is not related to the degree to which operators are beset by emotional problems (emotional upsets are an inevitable and natural consequence of living), but rather to the effectiveness of the methods by which they handle or cope with these problems.

a. Driving proficiency can be increased by developing the habit of evaluating our emotional fitness to drive and:

(1) putting aside those problems which tend to distract our attention from the driving task (admittedly, this is difficult);
(2) waiting until the strength of the emotion subsides to a safe level before assuming the driving task (strong feeling cannot be quickly changed); and
(3) selecting an alternative means of reaching our destination, if emotions are so strong that we cannot control them sufficiently to perform the driving task safely.

b. We can minimize the hazard potential of traffic induced frustrations by examining situations which are irritating and:

(1) insofar as possible avoid those situations by thoughtful trip planning; and

(2) acquire a mind set in advance on how you plan to handle frustrating situations.

c. By empathizing with other highway users we will be more likely to tolerate their mistakes and, therefore, less likely to become irritated.

(1) Realize that most of the mistakes we see other drivers make, we have committed at one time or another.
(2) Blaming the slow driver for making it "necessary" to pass on a curve is simply expressing the childish "look what you make me do" attitude.

d. We may be able to prevent a serious consequence by dissuading a friend or relative from driving when they are under severe emotional stress.

3.3 Motivation or reason for being on the highway influences a person's behavior as an operator.

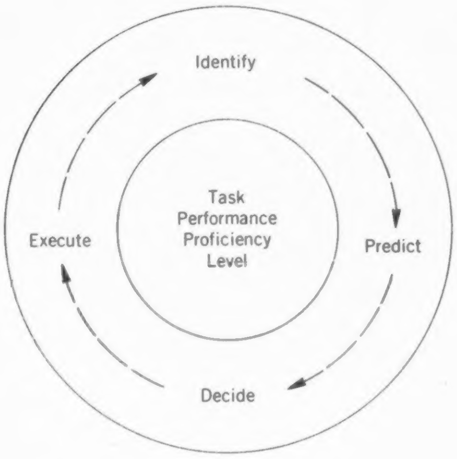
a. In addition to serving as a means of transportation the vehicle is used to satisfy personal needs, such as:

(1) freedom and escape from parental control;
(2) socialization and dating;
(3) to prove maturity - a symbol of growing up;
(4) to gain attention, power and influence;
(5) to explore and experiment; and
(6) to act out tensions. (Pouring your emotions through the accelerator pedal can really get you into trouble.)

b. With a few exceptions these motivations for driving are natural and healthy signs of the maturation process, but the operator must not permit the motivation for driving to interfere with his proficiency to perform the task.

(1) The pleasure and exhilaration of driving increased by being with friends, could be seriously distracting to the operator.
(2) Frustration caused by unmet personal needs–status within a group, achievement and recognition, affection, etc.–can cause actions of aggression, hostility, impulsiveness, competitiveness and showing-off with the automobile as the instrument.

(3) To gain status and security within a preferred group, an individual will tend to drive in accord with the group norms related to driving.
(4) The knowledge that one has been entrusted with an adult responsibility can be a strong incentive to proper driving behavior.



Episode Delineation Form

UNIT A Title: Operator Fitness

EPISODE 4.0 Title: Fatigue And Carbon Monoxide

EPISODE PURPOSE: Fatigue (getting tired) is a natural built-in limitation of the body and is something that happens to everyone, everyday. Unfortunately, the effects impair a person's ability to perform the tasks associated with operating a motor vehicle. As a consequence of these two conditions, drivers are frequently compelled to make fatigue-driving decisions. This episode is designed to develop an awareness of the factors that should be considered when making these decisions. In addition, the episode will include the precautionary measures aimed at reducing the carbon monoxide hazard, and the reasons behind the measures.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
4.1	Causes of Fatigue	Identify the causes of fatigue.	
4.2	Effects of Fatigue	Predict the effects of fatigue on human functions and operator performance.	
4.3	Handling Fatigue	Formulate personal guidelines for minimizing the danger of fatigue induced accidents.	
4.4	Carbon Monoxide	Classify the (1) source of carbon monoxide, (2) effects on body functions and operator performance, (3) conditions that increase the chances of carbon monoxide poisoning, and (4) precautionary measures.	

CONTENT

4.0 While the exact extent of their effect is difficult to assess, fatigue and carbon monoxide obviously interfere with driving performance and in some instances cause fatalities.

4.1 Fatigue is a complicated biologic reaction to prolonged or intense physical and mental activity.

a. Fatigue is induced not only by inadequate sleep or rest and physical work, but it can result also from extensive study and thought.

b. Psychological (emotional) stress or even boredom can also play an important part in causing fatigue, or compounding a fatigue situation.

c. Fatigue accompanies illness because your body is using energy to get rid of the disease.

d. Sunglare is a major factor in eyestrain and helps to cause fatigue and drowsiness.

e. Overeating, alcohol, drugs, overheated car and carbon monoxide compound the effect of fatigue.

f. Driving is a learned skill which is affected by fatigue and, in addition, driving is an activity which makes you tired (particularly monotonous, uninterrupted driving).

4.2 Fatigue causes physiological changes which result in reduced performance by the systems of the body. This, in turn, impairs the operator's ability to function effectively.

a. Effects of fatigue on operator performance are similar to those of alcohol and drugs and frequently are associated with them.

b. Effects of fatigue are generalized throughout the body, causing:

(1) narrowing of the visual field;
(2) impairment of sensory acuity;
(3) delayed and distorted perceptions (perceptual skills have been demonstrated to deteriorate more than motor skills after prolonged driving);
(4) impaired judgment and prediction;
(5) delayed decision-making and reactions; and
(6) reduced control and timing of neuromuscular skills.

c. Because of these effects a fatigued operator is more likely to:

(1) ignore or fail to recognize critical elements in the traffic environment,
(2) be affected by glare,
(3) misjudge the speed or distance of another vehicle,
(4) take a chance in passing or some other rash move,
(5) become irritable, discourteous and over-react to minor irritations, and
(6) make a clumsy or impulsive action while maneuvering the vehicle.

d. Unfortunately, an operator may not recognize that his driving has deteriorated from the effects of fatigue.

e. Fatigue, particularly when caused by sleep deprivation, is accompanied by drowsiness, the state of being "half asleep," or almost asleep. You may lapse into a state that resembles being on "automatic pilot," or a "Zombie" effect.

f. Some drivers who are very tired get "foot heavy" and drive at excessive speeds without their immediate knowledge, while on the other hand others slow down without realizing it to a dangerous or illegal speed on freeways and in tunnels.

g. In extreme fatigue, operators have been known to experience hallucinations and to swerve or brake suddenly to avoid obstacles perceived but not actually present.

h. Collisions involving a driver who has fallen asleep (sleeping is not always a voluntary activity) are usually characterized by no skid marks or evidence of evasive action prior to impact.

4.3 Certain measures can be used to delay the onset of fatigue while driving, to compensate for the effects of fatigue already present, or to respond to an extreme state of drowsiness.

a. Fatigue and drowsiness represent a fortunate warning to be heeded even though our arrival time will be delayed.

b. To help maintain mental alertness and avoid the onset of fatigue on long trips:

(1) be well rested when starting the trip;
(2) keep your eyes moving;
(3) wear good quality sunglasses in bright sunlight;

(4) avoid heavy foods and alcoholic beverages;
(5) keep the car well ventilated; and
(6) stop periodically for rest and light exercise.

c. When extremely tired or drowsy, remind yourself that no date, no rendezvous with friends, no athletic contest, no destination of any kind is worth a gamble with death on the highway, so:

(1) let someone else drive but make certain the other person is alert and wide awake; or
(2) stop off the highway in a safe place, *turn off the ignition,* lock all doors, and take a nap as a temporary measure. (Most modern freeways have well protected rest areas and/or parking areas at restaurants and gasoline stations which are good places to nap.)

4.4 Carbon monoxide poisoning can be prevented by using what we know about the source and nature of the poison to protect ourselves from this danger while operating a motor vehicle.

a. The major source of carbon monoxide is automobile exhaust.

(1) When fuel is incompletely burned, it gives rise to carbon monoxide.
(2) An automobile engine produces enough carbon monoxide to make a closed garage deadly within five minutes.
(3) Exhaust control devices now required on new cars has reduced carbon monoxide emissions.
(4) Carbon monoxide from cigarette smoking in a closed automobile can reach a dangerous level.

b. Carbon monoxide causes oxygen starvation in the tissues.

(1) By combining with the hemoglobin in the red corpuscles it reduces the oxygen carrying capacity of the blood, causing tissue starvation.
(2) Oxygen starvation affects the brain and heart and may cause death within minutes depending upon the concentration of carbon monoxide breathed into the lungs.

c. In addition to the concentration of carbon monoxide in the air, another major factor is the length of time a person is exposed.

(1) Long exposure to low concentration is likely to be more serious than shorter exposure to a higher concentration (effect builds up).
(2) As little as one part in one thousand parts of air breathed for 90 minutes can be fatal.
(3) Repeated exposure to carbon monoxide results in increased susceptibility and can cause cumulative damage.

d. Carbon monoxide is not evident to the senses (colorless and odorless), so if the concentration is high a person might lose consciousness without any warning sign. On the other hand, the following symptoms may become apparent if the carbonhemoglobin level builds up somewhat gradually.

(1) Tightness across the forehead followed by throbbing in the temples.
(2) Headache, weakness, dizziness, nausea, loss of muscular control and increased pulse and respiration rate.
(3) Symptoms multiply rapidly as the level increases resulting in dimness of vision, severe nausea, fainting, coma and finally death.

e. Carbon monoxide poisoning, of which most drivers would probably be unaware until it is too late, is a prime suspect in many automobile accidents.

(1) Carbon monoxide in the blood may aggravate or intensify normal driving fatigue and drowsiness, thus contributing to one-car accidents particularly.
(2) The amount of carbon monoxide in the blood of a driver is linked directly with increase in his reaction time and a drop-off in his ability to judge time, distance or differences in speed between his car and another.
(3) Many people are found dead in parked automobiles usually with the ignition on, the gas tank empty and the battery dead.

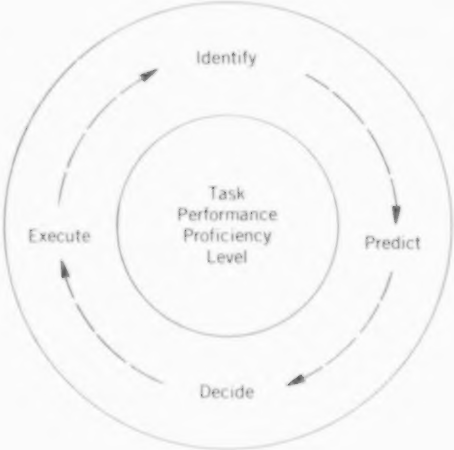
f. Certain weather, vehicular and driver conditions increase the chances of carbon monoxide poisoning.

(1) The danger of carbon monoxide poisoning is increased in hot humid weather.
(2) Snow around the car may "pocket" the gas and cause it to seep into the car.
(3) Children and adults with physical defects such as bronchitis, asthma, overweight, alcoholism and chronic ear disease are particulary susceptible to the effects of carbon monoxide.
(4) Poor ignition and faulty carburetor adjustment may be a factor.
(5) Loose exhaust pipe or manifold connections, a cracked exhaust manifold, a leaky muffler (a muffler can be leaky without being noisy) or tail pipe are prime sources of trouble.
(6) Engines from new cars produce as much carbon monoxide as old engines, but older cars are more likely to have leaks in the exhaust system.

(7) The slower the speed the greater the amount of carbon monoxide produced by automobiles. (Freeways during commuting hours are especially dangerous.)

g. If certain precautionary measures are followed the danger of carbon monoxide poisoning is minimized.

(1) Keep a window partially open at all times for proper ventilation.
(2) Close air intakes temporarily when traveling in slow moving traffic or while driving through tunnels, and shut off the engine when delays cause you to stop for longer than a minute.
(3) Always keep the garage door open when the vehicle is inside and the engine is running.
(4) Never drive with the car's trunk door open even slightly or with a station wagon's back glass down. (Suction can bring exhaust gas into your passenger compartment.)
(5) Replace muffler or tail pipe if clogged or damaged by corrosion. Have bent or broken exhaust tail pipe straightened, repaired or replaced.
(6) If any holes are drilled in the firewall to install accessories be sure of adequate sealing.
(7) Children should not be placed on the car floor to sleep.
(8) Revivals have been made with artificial respiration, by application of oxygen, keeping the victim cool to reduce the oxygen demand.



Episode Delineation Form

UNIT A Title: Operator Fitness

EPISODE 5.0 Title: Other Impairments

EPISODE PURPOSE: The extent of highway hazards created by physically and mentally unfit drivers depends largely on individual operators recognizing and compensating for their impairments. A handicapped person may still drive if, on the basis of a strong feeling of responsibility, he compensates for the handicap and adjusts his driving to the degree of his proficiency. This philosophy is stressed in the episode so that the students are more likely to be tolerant, and thus more effective, as they interact on the highway with handicapped and aged drivers. Furthermore, the few young people in the class who already suffer from some disability will be encouraged.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
5.1	Compensations for handicaps	Identify physical handicaps for which effective means of compensation are available (in motor vehicle operation).	
5.2	Age factors	Summarize the major points related to the question, "How valid is calendar age as an index of driving competence?" Given a list of driving violations and errors, predict which ones are more likely to be committed by young drivers and those more likely to be committed by elderly drivers, with a statement to support each choice.	
5.3	Driver Licensing Standards	Describe the problems and promising solutions related to physical and mental standards for driver licensing.	

CONTENT

5.0 In many cases, the handicaps imposed by a physical disability, or the aging process, can be compensated for so that the person can be considered "fit" to operate a motor vehicle.

5.1 A person free of physical defects is *potentially* a competent driver, but having a chronic disease or impairment does not necessarily signify any serious interference with the driving function.

a. Sometimes a compensating operator performs better than expected for a non-handicapped person. Reports from a number of states have indicated better driving records of persons with defective hearing as compared with normal hearing. Some possible explanations are that:

(1) proper seeing habits and well developed perceptions of potential driving hazards are highly prevalent in deaf drivers;
(2) there is full concentration on driving with absence of radio and conversational distractions; and
(3) deaf drivers generally recognize more so than the great mass of hearing drivers that a driver license is a privilege to be respected and guarded.

b. Persons with recently acquired impairments lack the compensating or adjusting ability of those who have had the same impairments over a significant period of time. (Therefore, drive with considerable caution if you suddenly acquire a visual or hearing defect, an injury, or some other disability which interferes with driving performance.)

c. Some remarkable achievements have occurred in equipping the vehicles of orthopedically disabled persons so that they can drive safely. (Some drive with only their arms or only their feet.)

d. Medically controlled epileptics and diabetics perform adequately in virtually all activities of life, including driving.

e. If physical fitness were the only requisite for becoming a competent operator the young driver would have the best record.

5.2 Young operators can increase their own safety and the safety of all highway users (particularly the elderly) through an awareness and appreciation of certain traffic related realities associated with the aged driver.

a. The aging driver is a significant factor in traffic, and he will steadily become a more important factor because his numbers are growing much faster than the total number of drivers.

b. Most older drivers want to continue driving as long as they are capable of safe driving (for the same reason as young drivers independence), and public policy should be based on helping aging drivers continue to drive enjoyably and safely.

c. Chronological age is a poor index of aging and also of driving competence.

(1) The important yardstick is not the calendar age but the functional age of the individual.
(2) Some persons can still drive safely in all types of traffic at age 80, while others might be unable to drive safely at 60 – both groups of drivers having been safe drivers at 50 years of age.
(3) Functional or pathological age (deterioration of the body) and calendar age do not run parallel, because pathological age is an individual characteristic.

d. Unquestionably, the physiological and behavioral changes which occur as man passes through his life span (particularly, the latter part) impair his capability to function as a highway user; but, on the other hand, the value of added experience and safety-mindedness tend to offset the deteriorating factors.

e. You rarely find older drivers and pedestrians consciously courting danger, speeding, or driving cars that are faulty to the point of danger, but you do find them caught up in unsafe situations and accidents caused by inefficient sensory-motor capabilities and unfamiliarity with modern highway facilities and traffic controls.

(1) Common errors of older drivers are: improper turning, failure to give right-of-way, ignoring stop signs, and improper entering and leaving the highway.
(2) A high percentage of pedestrian fatalities are over 65 years of age.

f. The older persons are often surrounded by the hostility of youth for elderly authority, and they tend to respond with hostility, hate, fear, or aggressiveness (acts of expression which are not particularly conducive to safe driving).

g. The deterioration process of aging is so gradual that the effects may not be recognized, or the individual may recognize his limitations and fail to admit them for fear of losing his driving privilege.

h. Young operators can help the situation by:

(1) empathizing with and compensating for elderly highway users (most of us will be there one day) so as not to compound their problems;
(2) tactfully educating elderly family members in regard to modern traffic conditions;
(3) helping authorities to remove the driving privilege from those who unreasonably endanger themselves and others by continuing to drive; and
(4) supporting efforts to protect the driving privilege of the many elderly drivers who continue to function efficiently.

5.3 Legislators and motor vehicle authorities, who are responsible for prescribing and implementing physical and mental standards for driver licensing, must rely on the cooperation of the medical profession and the general public.

a. One of the major obstacles to an effective driver licensing program is the difficulty of *identification* by licensing authorities of operators whose impairments make them unfit to drive.

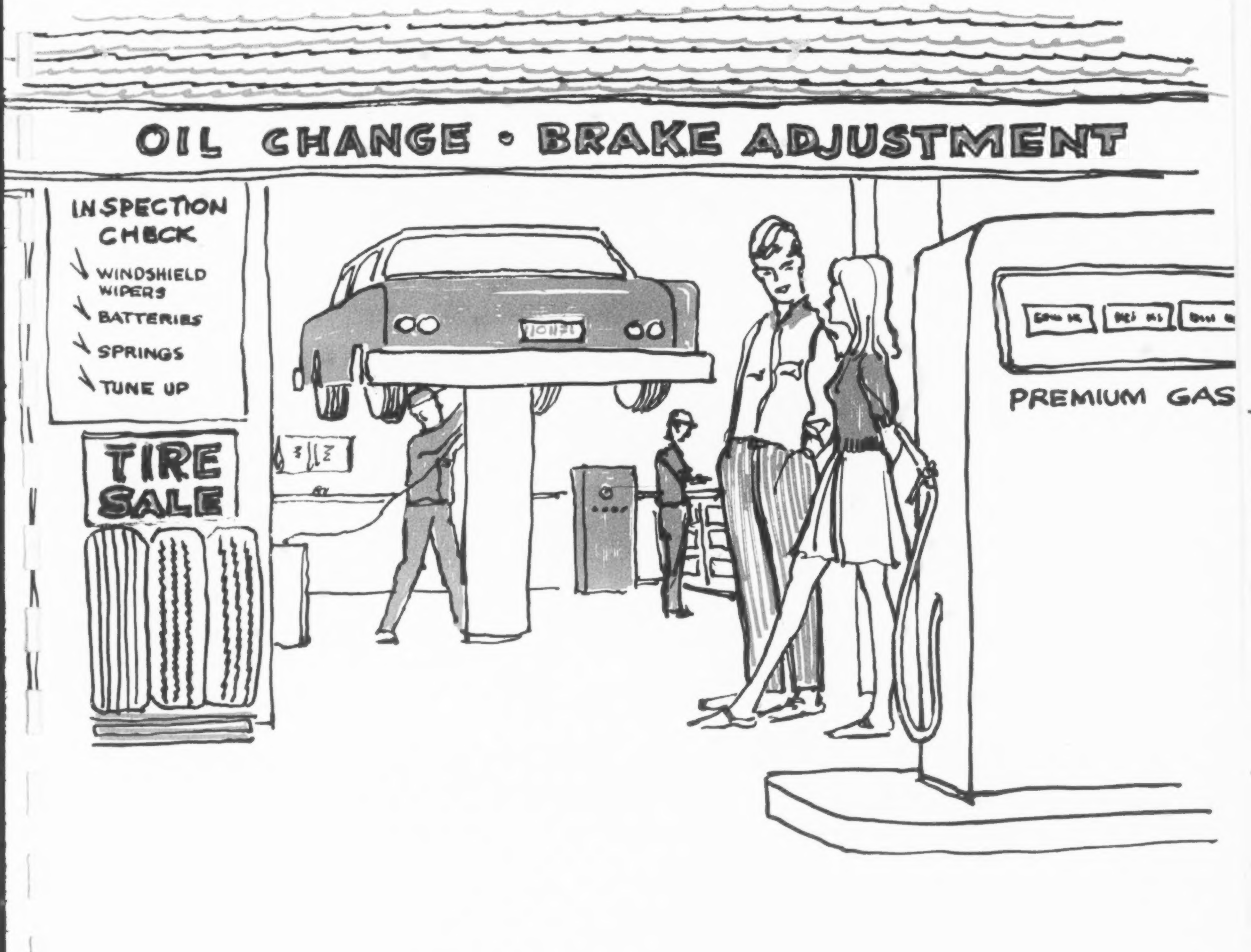
(1) A person free of any significant impairment today may acquire a disability within a relatively short time thereafter. (A state of health is not constant.)
(2) There is a tendency on the part of operators to conceal a disability that might cause them to lose their driver's license or to have it restricted.
(3) Routine physical examinations, although quite revealing, are not infallible means of detecting conditions which will interfere with operator performance. (For example, epilepsy, mental disorders, cardiovascular disorders and many other health problems are difficult to identify in a routine examination.)
(4) Licensing authorities must communicate with and seek the cooperation of other state agencies who have already identified persons with disabling mental or physical health problems.
(5) Operator responsibility lies in responding accurately to questions by driver licensing officials related to the individual's medical history.
(6) Periodic re-examinations of drivers can help with the identification problem.

b. The medical profession can be an effective force in counseling individual patients and licensing authorities regarding operator fitness.

(1) A physician who examines or treats a patient is in the best position to know and advise that person about impairments which interfere with driving performance.
(2) The traditional doctor-patient relationship raises the question about the doctor's responsibility when he recognizes a disability in a patient which he knows impairs that patient's ability to drive.
(3) In some jurisdictions medical advisory boards have provided licensing authorities with professional medical knowledge to help authorities make administrative decisions related to licensing regulations.
(4) So little pertinent research has been done that, except in the case of glaring physical defects or gross deficiences, it is not known which of the physical impairments, disabilities or diseases make an operator incompetent.
(5) The medical profession, given the resources, has the capability to acquire research-based knowledge of what should be included in the driver licensing examination and other standards. However, in the absence of any group of medical specialists trained to deal with the operator and his tasks comparable to those developed for the pilot and flying, a rather permissive situation exists.

c. Driver licensing officials and the medical profession are limited in their ability to relate the driving privilege to the physical and mental condition of motor vehicle operators; therefore, the highway system will have to depend considerably on the individual operator for evaluating his own fitness and for taking appropriate action to eliminate or compensate for the hazard caused by his deficiencies.

d. Difficulties stand in the way of any needed official action, restrictive of the driving privilege, that needs public support, because legislators and the public at large are so directly affected by the action. (How much driving freedom are we willing to give up for safety?)


OIL CHANGE • BRAKE ADJUSTMENT
INSPECTION CHECK
WINDSHIELD WIPERS
BATTERIES
SPRINGS
TUNE UP
TIRE SALE
PREMIUM GAS

SECTION II - READINESS TASKS

Unit B - Vehicle Readiness

Unit Objective:

Students will be able to develop a vehicle maintenance and selection program that will facilitate optimum performance from a vehicle suitable for trip requirements.

Episode Titles:

1.0 Vehicle Sub-Systems – Prerequisite Knowledge
2.0 Vehicle Management – Selection and Maintenance

Episode Delineation Form

UNIT B Title: Vehicle Readiness

EPISODE 1.0 Title: Vehicle Sub-Systems – Prerequisite Knowledge

EPISODE PURPOSE: How much the driver needs to know about the machine he operates in traffic appears to be an unresolved issue at this time. Almost everyone would agree that drivers need not be thoroughly knowledgeable, nor should they be completely ignorant, with respect to vehicle mechanism. The answer to the original question lies somewhere between these two extremes, which represents a wide latitude.

"Vehicle selection and maintenance" and "vehicle control" appear to be appropriate criteria for selecting content and method in this area of the driver education curriculum. It is assumed that the operators need certain knowledge about the vehicle in order to select and to maintain a vehicle properly, and they need certain knowledge to develop the poise, confidence and control of an expert driver. Both maintenance and control, two closely related factors, serve as *means* to completing the trip objectives. To meet the second criteria (control), this project integrated material on the "dynamics of vehicle control" in Section I, Unit A–Basic Control Tasks. It is suggested that any additional content on vehicle sub-systems that students need to know for selection and maintenance purposes be taught either as a separate episode here (Episode 1.0), or be integrated with Episode 2.0.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
1.1	Power–Source and Transmission	Given a diagram of the power train, trace the power from the engine to the rear wheels describing the function of the major parts. Given a diagram of the cylinder combustion chamber with piston, spark plug, valves and connecting rod, describe how the fuel and electrical systems interact to create power.	Classroom instruction time should be limited on this episode, since the knowledge can be acquired by independent study outside of class, assuming that the material is well-programmed and illustrated. Moreover, some students will have learned about the automobile mechanism through other courses or in experiences outside of school. (The internal combustion engine is now being taught in elementary school science.)
1.2	Lubricating and Cooling Systems	Summarize the important roles played by the lubricating and cooling systems in keeping the engine going.	

CONTENT

1.0 Power, available to the driver via the accelerator pedal, is made possible in the internal combustion engine, by the interaction of the fuel and electric systems, assisted by the lubricating and cooling systems.

1.1 The burning of a gasoline-air mixture in an enclosed space (cylinder) is the source of power.

a. A fuel pump draws gasoline (potential energy) from the storage tank and delivers it to the carburetor where it is atomized and mixed with air to form a combustible vapor. Two filters are involved in this process:

(1) A filter in the gasoline line between the tank and the carburetor removes dirt, rust, scale, moisture and other harmful particles.

(2) An air filter mounted above the carburetor removes the impurities from the staggering amounts of air required to operate the car (protects carburetor and cylinder parts).

b. From the carburetor the combustible vapor is drawn into a closed (except for intake and exhaust valves) cylinder with a close fitting piston, where fuel and electrical systems combine to convert heat energy of expanding gases into mechanical energy.

(1) Vapor is compressed in the cylinder by piston action, and ignited by a spark plug which causes instantaneous burning. The resulting action thrusts the piston down.

(2) The downward thrust of the piston is converted into a rotary motion–a twisting force called torque-by the crank shaft attached to the piston.

(3) Most vehicles have four, six or eight cylinders-piston combinations, each exerting a downward thrust at a different instant. This arrangement provides a continuous and smooth power production.

c. The twisting force of the crankshaft is transmitted to the rear wheels via:

(1) *clutch* - connects and disconnects the flow of power from the engine to the rear wheels;

(2) *transmission* - speed and power changing device;

(3) *driveshaft* - transfers power from the transmission back to the differential which transmits it to both wheels:

(4) *universal joints* - provides a flexible joint so that power can be delivered while the differential is bounding up and down from road shock; and

(5) *differential* - transmits the twisting force of the driveshaft to the axle shafts which are at right angles to it, and allows the rear wheels to turn at different speeds in turning corners.

d. The battery stores electricity supplying current to start the engine and to operate the accessories.

(1) When the ignition and starter switch (usually combined) are turned on, electricity flows from the battery to a small electric starter motor which spins and cranks the engine.

(2) A generator or alternator, turned by the fan belt, provides current when the engine is running and keeps the battery charged. (A voltage regulator prevents overcharging and undercharging.) The ammeter light or needle tells you whether the current is flowing out or into the battery.

1.2 Lubricating and cooling systems are needed to keep the engine and power train functioning. In addition to the heat created by the burning of fuel, moving metal parts create friction which produces heat within the engine.

a. Motor oil from the crankcase is pumped throughout the engine to:

(1) prevent metal to metal contact;

(2) collect contamination - exhaust gases and products that result from burned gasoline; and

(3) serve as a seal between cylinder and piston walls.

b. Good oil does not wear out, but contamination can build up to dangerous proportions. Thus oil must be filtered and changed periodically.

c. Some parts of the engine would quickly destroy themselves if much of the heat were not removed in a cycle of continuous cooling. The cooling function is performed by a continuous circulation of coolant being pumped around hot interior parts to absorb heat and then flowing down to the radiator where incoming air carries the heat away.

d. A fan belt turns the fan which pulls an air stream through the radiator and it also turns the water pump which circulates the coolant through the system. A thermostat aids in maintaining a range of temperature conducive to efficient engine operation (an engine can run too cold).

Section – II

Episode Delineation Form

UNIT B Title: Vehicle Readiness

EPISODE 2.0 Title: Vehicle-Management – Selection And Maintenance

EPISODE PURPOSE: This episode aims to increase the student's ability to make informed decisions about vehicle maintenance and selection. Major emphasis is placed on signs and symptoms of vehicle malfunction, probable cause and consequence if not corrected, and how to prevent the trouble in the first place. Attention is also given to safety and cost factors to be considered in selecting the most appropriate vehicle, and equipment options for a given set of objectives and operating conditions.

Justification for this episode lies in the fact that deterioration and malfunctions of the automobile affect power, maneuverability and stopping ability. Furthermore, there are strong indications that disabled vehicles stopped along the highway present a serious hazard to the victim and others traveling that portion of the highway. In light of these realities a trip should not be started until the driver is reasonably certain that the vehicle is prepared and suitable for the trip requirements.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
2.1	Owner Responsibility	List reasons for properly maintaining a vehicle.	
2.2	Signs and Symptoms	Match various mechanical problems with the means of detecting the problem.	
2.3	Preventive Maintenance	Given a list of vehicle components (cooling system, battery, tires, etc.), list the periodic checks that should be made to maintain efficient and economical operation.	
2.4	Operating Conditions	Given various operating conditions, state the implications these conditions have for a vehicle maintenance schedule.	
2.5	Choosing a Service Agency	Formulate criteria and guidelines for selecting and dealing with a service agency.	
2.6	Vehicle Selection	Given a case study of a young person with specified needs and resources who purchased a car, identify the good and bad decisions made by the purchaser (steering, brakes, power, style, cost, payments, etc.).	

CONTENT

2.0 One mark of a competent vehicle owner is that he selects an appropriate vehicle for his needs, and then preserves its efficiency with preventive and corrective maintenance at minimum cost.

2.1 Each owner must assume responsibility for the maintenance of his vehicle; furthermore, it is to his advantage to do so.

a. Assuming this responsibility is only common sense, because proper maintenance of the vehicle increases the probability of reaching your destination safely, conveniently and economically.

b. Letting your vehicle deteriorate can lead to:

(1) poor performance,
(2) breakdowns on the road,
(3) accidents,
(4) excessive repair bills,
(5) less mileage per gallon of gasoline or quart of oil,
(6) conviction for a traffic violation, and
(7) lower resale value.

2.2 Vehicles seldom develop mechanical problems without giving some warning sign. Early identification and correction of these symptoms is important, just as it is with the human body.

a. The better you understand how vehicles work, the easier it will be to recognize the first signs of trouble and describe them accurately to a mechanic so that he can track down the difficulty and correct it.

b. Vehicle malfunctions can be detected by an abnormal "feel" in the control devices, by abnormal sounds and odors, and sometimes by visual means.

(1) Engine troubles can be determined by the way in which the engine starts, idles, accelerates at various speeds or sounds; by excessive oil consumption, which usually indicates piston and ring defects; and by the color of exhaust smoke–black or blue smoke usually signifies the need for carburetor adjustment or engine overhaul.

(2) Troubles related to engine temperature, oil pressure, battery charging can be observed on the warning lights or gauges.

(3) Battery failure may come rather suddenly, resulting in the inability to start the engine.

(4) The way the brake pedal feels (soft or spongy, hard pressure required, falls away under foot pressure), sounds (squeal, click, rattle or chattering noise), or causes the vehicle to respond (grabbing brakes, pulling to one side, brakes heat-up or failure to release or to hold) become your "detector" of failure or malfunction.

(5) Problems in the steering and suspension system are usually revealed through the steering wheel ("shimmy," free-play, pull to one side, hard steering, poor return from turns and temporary loss of power assist); by hard or rough riding qualities; by tire squeal on turns or or other noises from the steering or suspension system; by one wheel sagging; or by *irregular or abnormal tire wear.*

(6) Uneven or excessive tire wear may also indicate a need for correction in tire pressure or in driving habits.

(7) Clutch and transmission problems are revealed through the "feel" of the clutch, by sounds and touch when shifting, by a noisy transmission, or by lubricant leaks from the transmission.

(8) Some other signs signifying a problem that needs attention are oil or water leaks (detection on the carport or garage floor), poor gasoline and oil mileage, dim lights and irregular flashing of the turn signal.

2.3 Since instruments, gauges and other signs cannot warn of all trouble in advance, and since changes in vehicle performance may occur so gradually that the driver fails to recognize them, preventive maintenance is important.

a. Preventive maintenance is checking and correcting a vehicle's condition regularly so as to catch any signs of wear or damage before they can cause real trouble.

b. Brakes wear out so that the driver is hardly aware of it; shock absorbers gradually lose their effectiveness, causing the car to wander without the driver's recognition of the hazard; and exhaust systems can fail undetected, allowing carbon monoxide to permeate the vehicle creating a serious hazard.

c. To increase the safety and efficiency of an automobile, drivers should see that the following are checked periodically by themselves or a service station attendant.

(1) *Cooling system* – coolant level and condition; radiator hose (hoses have a limited lifetime due to water and heat); and radiator grill for dirt, leaves and insects.
(2) *Battery* – electrolyte level; external condition of battery, and cables for damage, cracks, warped case and corrosion (remove corrosion with soda solution and apply petroleum jelly on the post and cables to prevent further corrosion); battery carrier and hold-down clamps; and fan belt tension and condition.
(3) *Tires, steering, and suspension systems* – tire pressure (test and inflate when cold); condition of tires (wear, cuts and cracks, bulges, foreign objects between the treads); wheel lug bolts or nuts; shock absorbers for unequal resistance; wheel alignment and wheel balance.
(4) *Brake system* – linings; shoes; drums; master and wheel cylinders; and backen plates (mounting support for brake units; also keeps dirt out of the drum).
(5) *Oil level and oil filters* – correct oil level is at the FULL mark on the dip stick or slightly below; oil filter must be removed to see if dirt and sludge is present around the base of the refills. (The dipstick will not reveal the condition of the oil.)

d. Operators of two-wheeled vehicles should frequently check chain play and lubrication, clutch and brake cable adjustment and lubrication, tightness of nuts and bolts, signs of metal fatigue, tire inflation and condition, and wheel spoke adjustment.

e. The owner's manual for your car furnishes guidelines for determining the time and mileage spans for periodic checks and maintenance, particularly with respect to:

(1) engine oil requirements and changing oil filter;
(2) proper grade of gasoline;
(3) cleaning and replacing carburetor air filter (check for excessive dust, dirt and oil at points of entry);
(4) servicing air conditioning (if so equipped) and cooling system;
(5) power train maintenance;
(6) ignition system and spark plugs; and
(7) engine performance evaluation (tune up.)

f. If the warranty on the vehicle systems is to be honored by the manufacturer, the owner must show proof that he followed the maintenance schedule outlined in the manual.

2.4 The kind of operating conditions make a difference in the need for vehicle maintenance.

a. Maintaining proper engine temperature (140° to 200°F) helps to throw off contamination of oil by acids and unburned gasoline. Proper engine temperature is facilitated by:

(1) a properly functioning engine thermostat;
(2) an open crankcase ventilating system; and
(3) avoiding short-trip driving and engine idling insofar as possible.

b. Oil changes should be more frequent in colder weather, dusty climates and short-trip driving.

c. Brakes wear out faster if a car is driven around town since they are used more often than in open highway driving.

d. Tires are more likely to go flat in hot weather.

e. Freeway driving is a severe test for any potentially weak points in the mechanism of a vehicle (tires, fan belt, etc.).

f. Certain driving practices are costly in terms of gasoline consumption, wear of tires and damage to the car:

(1) excessive speed,
(2) quick starts and stops,
(3) turning too fast,
(4) racing the engine,
(5) improper gear selection,
(6) striking curbs, "chuck-holes", and obstructions, and
(7) misuse of clutch (manual transmission).

2.5 A most important factor in your vehicle maintenance program is to choose a reliable service agency (automobile dealer, independent garage or gasoline station) with reliable mechanics; otherwise, you are going to spend money for repairs that are not needed or are not properly done.

a. Unless the operator is mechanically inclined he will be limited in his ability to diagnose his car's ills, evaluate the proficiency of repairs, judge the reasonableness of repair costs, or otherwise exercise sound judgment concerning automotive repairs.

b. Just because a repair facility is associated with a dealership is no insurance of its competency, but the chances are that the dealer's mechanics will be better trained in the intricacies of that particular make than one who works for an independent garage or gasoline station.

c. Possible sources of information helpful in selecting a reliable servicing are the local Chamber of Commerce, Better Business Bureau, your automobile insurance carrier, friends, neighbors and relatives.

d. Diagnostic centers, established to pinpoint a car's mechanical problems through the use of highly sophisticated electronic and mechanical testing equipment, are springing up rapidly. (Work can be done at any garage.)

e. Although most automobile mechanics are honest, evidence is mounting that the American public is being victimized to the tune of millions of dollars annually by auto repair racketeers. Common forms of these swindles are:

(1) padding the bills with unauthorized repairs,
(2) charging of parts which are never installed,
(3) outright shakedown of customers, and
(4) replacing whole units instead of components.

f. There is need for nationwide minimum standards for repair facilities and mechanics.

g. To protect yourself from being victimized by dishonest repair and service people:

(1) become familiar with what is under the hood of your car;
(2) never permit big repair jobs to be made without your consent;
(3) before work has begun, get the prices in writing for all repairs you have authorized (not always possible);
(4) avoid strange garages if you can, but if your car breaks down on the road check by phone with the nearest Better Business Bureau or Automobile Club;
(5) ask in advance for the return of any parts replaced;
(6) whenever possible, tell the mechanic what is wrong; and
(7) demand an itemized bill.

h. Viewing the present and expected shortage of competent automobile mechanics, there appears to be a need for a "crash" program to meet the problem.

2.6 Many people pay more to own and operate a vehicle than they pay for housing or any other commodity, so it pays to be businesslike in selecting and owning a vehicle.

a. If a person purchases a vehicle beyond his financial means, then he will not have the money to take care of preventive maintenance.

b. The thoughtful buyer compares the capabilities and limitations of various equipment options in light of his objectives for purchasing the vehicle, driving conditions, safety and the money he has available for initial purchase, and for operation and maintenance (engine type and size, manual vs. automatic transmission, air conditioning, power vs. disc brakes).

c. Knowing the telltale signs of good and bad used cars is essential when you "shop" for a used car. (If you are not familiar with what to look for, take someone with you who is.)

Identify
Predict
Decide
Execute
Task
Performance
Proficiency
Level

SECTION II - READINESS TASKS

Unit C - Trip Plan

Unit Objective:

Students will be able to plan both short and long trips allowing adequate time, knowing the precise route, selecting appropriate equipment and considering other factors that will increase the chances of completing the mission safely, conveniently and economically.

Episode Titles:

1.0 Trip Planning and Pre-driving Inventory

Section – II

Episode Delineation Form

UNIT C Title: Trip Plan

EPISODE 1.0 Title: Trip Planning And Pre-Driving Inventory

EPISODE PURPOSE: Whether the trip is long or short, the operator selects a route, decides when to travel, and considers special equipment for the particular mission. During the approach and entry to the vehicle the driver assures himself that the vehicle, self, passengers and the load are indeed ready for departure. Any neglect in this final pre-driving stage can result in subsequent inconvenience, frustrations and unsafe conditions. This episode emphasizes principles and practices related to trip planning and the pre-driving inventory that reduce the demands on the operator once the trip is underway.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
1.1	Alternatives to Driving	Given alternative means of travel (air, rail, bus, private car), and information surrounding the situation, identify the advantages and disadvantages of each.	
1.2 1.3	Route Selection Time Factors	When given origin and destination points for a long-distance trip, identify the best route, locations of critical decisions relating to route changes, desired times to travel, planned stops, cost and other factors.	
1.4	Equipment	Given the conditions (origin and destination, time of year, people involved and other relevant information), prescribe the standard and special equipment which should be taken.	
1.5	Pre-driving Inventory	Following a correct sequence of steps, enter, prepare the vehicle, self and passengers for driving without error.	
1.6	Auto Thefts	Identify the measures under driver control that can reduce the number of auto thefts.	
		Culminating Objective: When given origin and destination points for a trip during the laboratory phase of the course, select and follow a route which minimizes the hazards.	

CONTENT

1.0 Trip planning, a crucial aspect of the driving task, can determine whether equilibrium is maintained in the man-machine-environment interaction.

1.1 Is the trip necessary, and if so, do you need to drive?

- a. Sometimes people use their vehicle for other than transportation need, which may or may not be appropriate. (See Section II Unit A, Episode 3.0).
- b. Through car pools (joining others going to the same destination) we can reduce the:
  - (1) number of vehicles needing roadway and parking space;
  - (2) opportunities for accidents-fewer vehicles, therefore, fewer possible conflicts; and
  - (3) cost.
- c. Public transportation, under certain conditions has advantages:
  - (1) Less expensive than driving a private vehicle if only one person is traveling;
  - (2) when relieved of the driving task you can relax, read, work, or enjoy the scenery; and
  - (3) air travel, particularly on long trips, reduces travel time considerably, allowing more time at your destination.

1.2 By clearly identifying the destination point of a trip and the best route to get there, drivers can avoid many frustrations and distractions enroute.

- a. With slight deviations from a crow's-flight route, a driver can often reduce the time, irritations and a number of hazards.
- b. Without sufficient preparation and proper navigation the driver may get lost or find himself on routes that present unexpected difficulties. (Furthermore, he may drive faster to make up time.)
- c. A "lost" driver searching for a street name, house number, and other route information is a hazard to himself and others. (Passengers can assist the driver in this matter.)
- d. In preparing for a trip the route(s) may be memorized or written down by studying maps, so that hazardous slowing to seek or study direction signs will rarely be necessary.
  - (1) At considerable expense and effort, automobile clubs, insurance companies, oil companies, highway departments, chambers of commerce and other organizations provide free maps to help travelers in trip planning. Some will plan your trip and mark the best routes.
  - (2) Since changes are occurring daily in our highway network system, the traveler should use the most up-to-date map obtainable.
  - (3) If a person is to interpret a map accurately, he must first become familiar with the symbols and markings (legend) printed on the map.
- e. Some of the factors to consider in selecting the safest, most convenient and economic route are the:
  - (1) length;
  - (2) kind of trafficway–number of lanes; controlled, limited or free access, etc;
  - (3) volume of traffic;
  - (4) toll roads or bridges;
  - (5) potential trouble spots, such as railroad crossings, congested access, unsignalized intersections with major highways, notoriously high accident locations, and difficult left turn situations;
  - (6) eating, sleeping and refueling places;
  - (7) scenery and places of interest; and
  - (8) the nature of the vehicle (two-wheeled vehicles and trucks are unsuitable or illegal on certain routes).
- f. By watching for confirming route signs, particularly after turns and on detours, the driver lessens the possibility of driving far out of his way at any time.

1.3 A key to trip planning is the selection of *time* when you travel, an element that you can control to some extent.

- a. The starting and arrival time for a trip should allow for a "time cushion" in consideration of service and rest stops, possible bad weather, traffic congestion and other unexpected delays (flexible planning).
- b. Drivers in-a-hurry due to a late start (when you start a trip 10 minutes late expect to arrive 10 minutes late), or *attempting to travel too far* in a limited time, tend toward chance-taking, excessive speed and impatience.
- c. Over-long trips–driving many hundreds and even a thousand miles without bed rest–is a common

dangerous practice (300 to 500 miles is a full day's drive). Too often a quick roadside rest gives the long distance driver a false sense of readiness.

d. You may not be able to control the tension-causing factors in your environment, but you can remove the added pressure of a deadline.

e. A relatively small amount of time is gained by driving 75 mph compared to 65 mph.

f. If you start and stop early in the day on long trips you will:
   (1) encounter less traffic;
   (2) make it easier to find suitable lodging; and
   (3) avoid night driving when navigation is much more difficult.

g. Trip time and frustration can be reduced by avoiding cities, tunnels, bridges and other known bottlenecks at peak periods of traffic. (Some cities place special traffic rules in effect during these periods.)

1.4 Special and standard equipment and preparation can help a driver and his passengers to cope with possible unusual or adverse environmental and seasonal conditions, vehicle breakdown, illness or accident, amusement of small children, and financial matters. Knowing what to expect and preparing for the worst is just as important as knowing what road to travel.

a. Properly functioning defroster equipment, along with disposable paper towels and a scraper, are an asset in keeping the car windows clear (inside and out), particularly when no service station is near.

b. In time, the rubber in windshield wiper blades deteriorates and the pressure of the blades against the windshield may change; therefore, a periodic check of this safety device is important.

c. Bad weather equipment which may be needed, depending on the locality and the season, includes: a small shovel; reinforced tire chains, a bag, box, or bucket of sand or ashes; a blanket, burlap bags, or section of carpet; and a tow rope or cable. (Winter comes early and stays late in high mountain passes.)

d. High altitude affects drivers and vehicles. "Thin air" (low oxygen content) causes quick fatigue and impairs vision, judgment and decision-making. Furthermore, engine horsepower declines as altitude gets higher.

e. Being able to control within-vehicle extremes, either in humidity or heat, can reduce driver and passenger discomfort, irritation and fatigue. Air conditioning also reduces noise level, another safety factor.

f. A spare tire, properly inflated, plus a jack and other tire-changing tools are essential items.

g. A few basic tools (screw driver, wrench, hammer) may be all that is needed on occasion to correct a minor vehicle defect.

h. Carrying a first aid kit in the vehicle when traveling, can reduce discomfort and suffering in the event of illness or an accident.

i. Special consideration needs to be given to entertaining small children riding in the vehicle, so that the children do not distract the operator, from his guidance and control tasks. Someone *other* than the driver should supervise the children.

j. When one proposes to pull a trailer, certain legal and safety considerations are essential (brakes, lights, hitch, springs, etc.).

k. A flashlight and flares are particularly helpful in the event that your car becomes disabled at night. The flashlight should be visible from at least 1,000 feet.

l. Jumper cables, although not a necessity, could prove to be quite valuable in an emergency created by a dead battery, especially for an automatic transmission car.

m. A fire extinguisher is rarely needed, if ever, but the need is crucial if it does arise.
   (1) Hundreds of thousands of automobile fires are reported annually.
   (2) Approximately half of the fires break out under the hood, the result of short circuits in the wiring.
   (3) The best means for handling a fire is a fire extinguisher, but unfortunately few drivers carry them.
   (4) In lieu of a fire extinguisher use a blanket, a top coat, dirt, sand, snow or anything that you can find *quickly* to *smother* the fire.
   (5) If the fire is small and water is nearby, use a hub cap as a container to douse water on the fire.
   (6) If the fire gets out of control move well away from the car, as the gas tank may explode.

n. If you use travelers' checks and credit cards, you can avoid carrying large sums of cash.

1.5 For the trip to get off to a good start, certain checks and preparations are essential on approaching and entering the vehicle, and in preparing the vehicle, passengers, cargo and self for driving.

a. When approaching and entering the vehicle the driver should:

(1) check inflation of tires and direction of front wheels;
(2) scan conditions in front and rear of vehicle which would interfere with movement;
(3) examine back doors, hood and trunk lid to see that they are securely closed;
(4) check windows to make sure they are clear and clean;
(5) enter the vehicle from the curb side if it creates a hazard to do otherwise. (Under conditions of light traffic one can enter safely from the street side, by first checking to see that no cars will be passing at the moment one is entering.)

b. By forming the habit of properly closing and locking all car doors the driver will:

(1) increase the chances of the doors remaining closed in the event of a collision and
(2) prevent an intruder from opening a door.

c. Proper seat and mirror adjustment, and driver position will help to produce:

(1) a comfortable ride;
(2) maximum field of vision and sight distance to the rear; and
(3) efficient handling of the control devices in routine and emergency situations. (In the case of some drivers, a cushion(s) may be needed to raise the eye level.)

d. The driver and other occupants of a vehicle can profit in numerous ways from using seat belts in proper fashion. (Drivers have good reason for requiring passengers to use seat belts.)

(1) The driver will be more likely to maintain his position for controlling the vehicle at sudden stops, on quick turns, skids and in minor collisions.
(2) With all the occupants "buckled down" the driver can give his undivided attention to driving with greater peace of mind, and he can feel free to apply the brakes as hard as necessary to avoid a collision.
(3) Using seat belts is a safety reminder on each trip, since the driver is admitting to himself that he could be involved in an accident.
(4) Seat belts keep the driver more alert by reducing fatigue and by keeping him in an upright position for better viewing.
(5) Seat belts furnish protection to vehicle occupants in the event of a collision by: (a) preventing ejection, (b) reducing the chances of being thrown around inside the car, and (c) by absorbing and spreading impact force to parts of the body that can take it.
(6) Not using seat belts may count against the driver in a financial settlement of a traffic accident.

e. Cargo of any kind (packages, books, etc.) will block vision or hurtle forward and become a dangerous missile if not stowed in a proper position in the vehicle. A heavily loaded vehicle can change wheel alignment, headlight aim, braking and acceleration performance.

f. If the car is somewhat unfamiliar to the driver, reviewing the location of the various gauges and devices and manipulating the brake, accelerator and steering wheel before moving the vehicle, will facilitate a smooth and controlled adjustment to the vehicle. Checking where brake action begins is best determined when the car is moving slowly.

1.6 Drivers can markedly reduce the chances of their vehicle being stolen.

a. Professional automobile theft rings do operate, but the pros are out-numbered by young amateurs who feel like joy-riding.

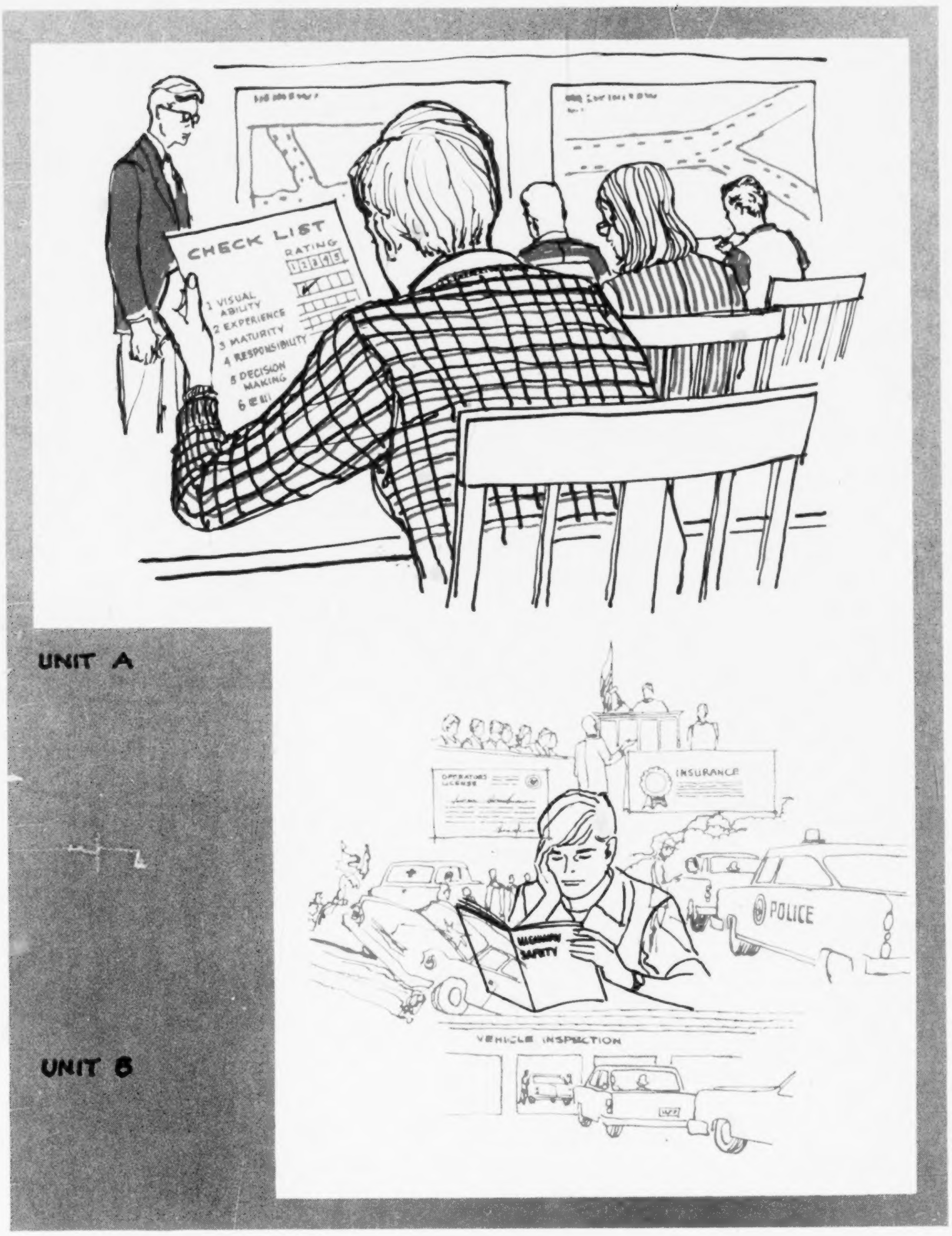
b. Drivers who tempt car thieves by leaving keys in the car or the doors unlocked are actually promoting accidents, because a disproportionate share of stolen cars are in accidents (many involving police pursuit).

c. Every driver pays a price for car theft—even if your car is not stolen— through increased insurance premiums and increased risks on the highway.

d. To reduce the chances of your car being stolen:

(1) always remove the ignition key;
(2) lock the doors and close the windows;
(3) do not attract potential thieves by leaving valuable items exposed in the car; and
(4) try to park in an area that is well lighted.

e. Auto manufacturers are including anti-theft devices on their automobiles.


CHECK LIST
RATING
1 VISUAL ABILITY
2 EXPERIENCE
3 MATURITY
4 RESPONSIBILITY
5 DECISION MAKING
UNIT A
OPERATORS LICENSE
INSURANCE
HIGHWAY SAFETY
POLICE
VEHICLE INSPECTION
UNIT B

SECTION III

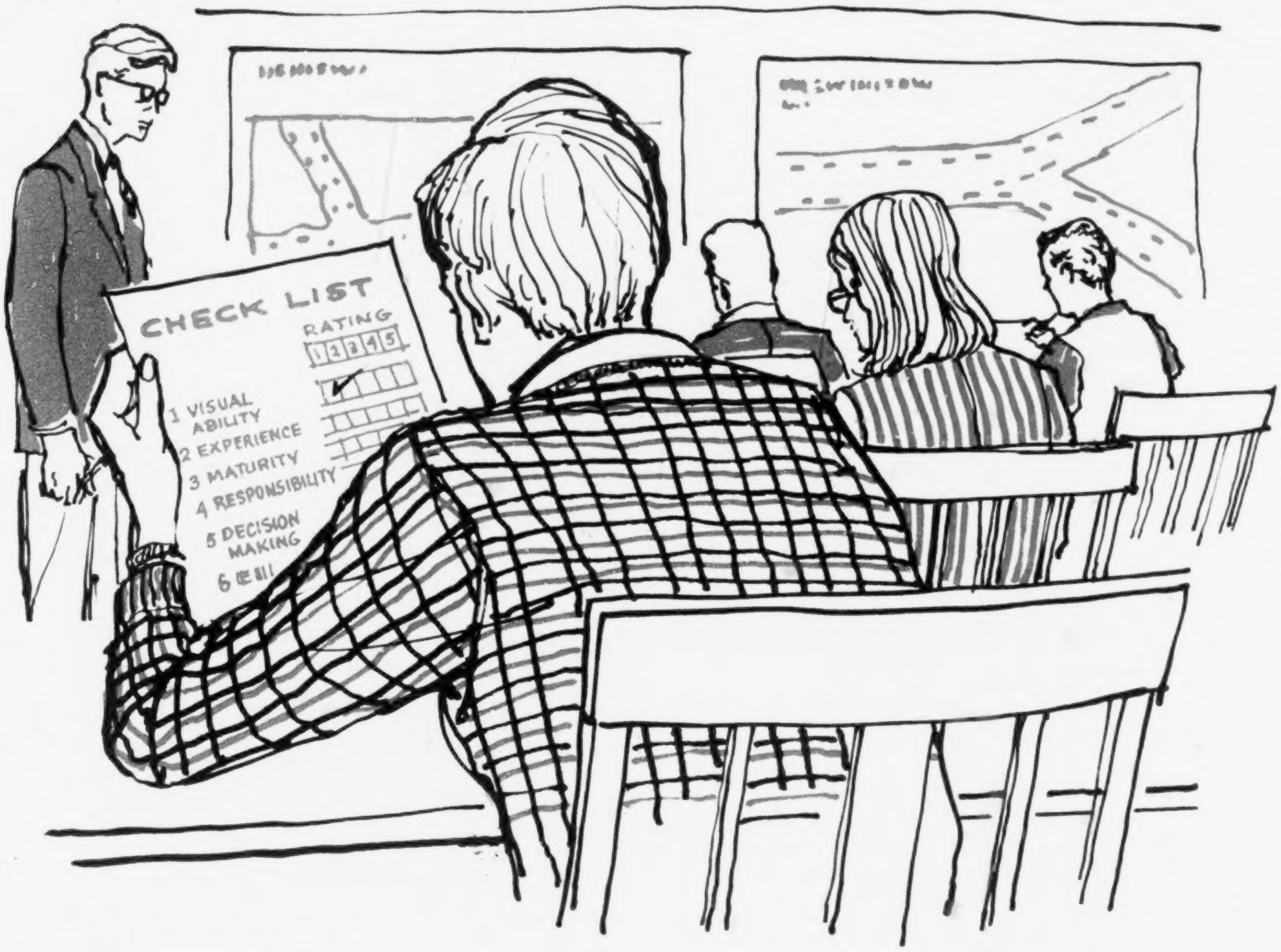
IMPROVEMENT TASKS

Section Goal:

Students will be prepared to identify and accept opportunities directed toward (1) improving their competencies as a highway user and (2) supporting efforts to improve the highway transportation system.

Unit Titles:

A. Self-Improvement
B. System Improvement


CHECK LIST
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3 MATURITY
4 RESPONSIBILITY
5 DECISION MAKING

SECTION III - IMPROVEMENT TASKS

UNIT A - Self-Improvement

Unit Objectives

Students will be able to (1) realistically assess their present capabilities to function as highway users, (2) appropriately compensate for their shortcomings, and (3) move toward excellence through a continuing self-evaluation and learning process.

Episode Titles:

1.0 Risk Acceptance
2.0 Self-Analysis and Improvement

Section – III

Episode Delineation Form

UNIT A Title: Self-Improvement

EPISODE 1.0 Title: Risk Acceptance

EPISODE PURPOSE: Operator competence is marked by wise and responsible decision-making. Underlying this episode is the assumption that students who understand their personal decision-making process, particularly with regard to risk, will build up internal standards of behavior. Moreover, these self-imposed standards will be more effective than adult-imposed standards.

In this and the following episode, method becomes all important. The purpose is not to convey information, but rather to help students "discover" why they behave as they do (motivation). Students will draw on their personal experiences through a series of searching questions posed by the teacher. The purpose of the questioning process is to stimulate students to formulate their own generalizations, basic to the development of *internal standards* for responsible behavior. No doubt the discussions will produce some different and more meaningful generalizations than are presented here. Those which follow only suggest some directions for the discussions.

A more detailed discussion of the inquiry method suggested here is found in Part IV.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
1.1	Risk Assessment	Identify and appraise the factors that motor vehicle operators (particularly youth) consider when assessing risks on the highway.	The basic concepts in this episode are likely to take on meaning if the teacher and students engage in a series of questions such as: What are some major kinds of risks that vehicle operators take? During the last week what are some of the risks that you saw other people–parents or friends–take while driving? In each example, what did the operator stand to gain by taking the risky action? How did this compare with the gain (advantage) of the alternative possibility? What about the potential loss in either the risky or less risky situation?
1.2	Individual Differences	Describe the reasons for individual differences in risk acceptance.	
1.3	Group Influence	Given a description of a social situation involving young drivers, identify group influence on individual behavior and suggest alternative responses that would have been more appropriate. (Safer and no loss of status within the group.) The same objective could be applied with students using situations from their own experience.	
1.4	Other Influences	Given a description of the physical and mental condition of a vehicle operator, predict the level of risk to be expected as a result of the operator's condition.	Does a vehicle operator always select the same alternative when confronted by the same situation? If not, what factors cause him to reach a different decision? Have you observed any examples in recent weeks to illustrate your previous answer? What controls are you going to impose on yourself to help you select appropriate responses consistently?

CONTENT

1.0 Values, needs and emotions influence the degree of risk that we are willing to assume in driving (risk acceptance).

1.1 Risk acceptance is influenced by our evaluation of the risk compared to the potential gain of assuming the risk. What is at stake, and what are the odds?

   a. Sometimes risks are taken in order to:

      (1) save time;
      (2) gain status;
      (3) experience a thrill;
      (4) satisfy our ego; and
      (5) punish ourself and others.

   b. Operator decisions typically balance a high probability of a small gain against a low probability of disastrous loss.

      (1) To gain a few seconds in time, an operator will risk a dangerous passing maneuver.
      (2) Because other ingredients needed to cause a collision were not present, operators are frequently successful in realizing small "gains" from accepting traffic risks, compared to a very low "failure" rate evidenced by collision involvement. (Tends to build up a false sense of immunity.)
      (3) Few operators are cognizant of the insignificant total time saved by shaving a few seconds here and there by speeding or other risk acceptance.
      (4) Tendency to maximize the gain and minimize the probable failure.
      (5) Risks are an inevitable part of living but the irresponsible person takes unnecessary risks when there is little if anything to gain.

1.2 Some operators have a higher tolerance to risk than others.

   a. An operator's personal-social needs and his values, which are not always compatible with safety, have a strong influence on risk acceptance.

   b. Operators may have a greatly distorted concept of risk due to faulty analysis and prediction of the traffic scene. (Especially true with young drivers whose driving experience is limited.)

   c. Younger drivers are inclined to take more risks than older drivers.

   d. Risk acceptance of men seems to be higher than it is for women.

1.3 The desire for status and security within a preferred group has a strong influence on risk acceptance.

   a. Young people, especially, sometimes use an automobile to gain social acceptance. (Man needs to belong to a group, to be accepted by others.)

   b. The individual tends to conform to the driving habits which prevail in the group to which he desires to belong. One must guard against being swept up with a group and committing foolhardly acts with a vehicle.

   c. The popularity of reckless conduct among some adolescent groups stems partially from their need to rebel against the authority of parents and teachers.

   d. Girls can influence the driving behavior of boys. (The reverse is also true.)

1.4 The same operator may be willing to assume more risk at one time than another. Our driving behavior, in general, fluctuates on a continuum from safe to unsafe behavior.

   a. Although risk is inescapable in driving, the operator is usually able to determine the degree of risk that he will accept.

   b. Risk acceptance may be affected by hurry, emotional state, physical condition, passengers, trip purpose, alcohol, distraction and other influences. We need to identify and correct for these transitory conditions.

   c. Reason tends to abandon the hopelessly hurried and frustrated person so that "poor" risks seem highly acceptable.

   d. A person might accept unusual risk in preference to the certainty of getting "bawled out" by a coach, parent or girl friends for being late.

   e. Deliberate choices that look beyond the pleasure, thrill or other attraction of the moment and consider the possible or inevitable consequences, are more appropriate than impulsive choices.

Episode Delineation Form

UNIT A Title: Self Improvement

EPISODE 2.0 Title: Self-Analysis And Improvement

EPISODE PURPOSE: This episode urges the student to answer these questions: What kind of driver am I now? What kind of driver do I want to be? How can I get to where I want to go?

As with Episode 1.0, learning activities should involve students in active searching for answers to relevant questions, rather than a passive listening to pearls of wisdom from the teacher. Asking students to draw on personal experiences and observation would encourage self-analysis in the future.

To manage effectively the question-discussion method suggested in this and other units, the teacher must step out of his customary role as the repository and conveyor of knowledge and become more like a counsellor. He (she) must listen more than talk, and avoid "preachments" when he does talk. In short, the teacher should provide meaningful situations (questions and other stimuli) that provoke thought and encourage self-analysis, as an essential step toward self-improvement. The content presented here is for the purpose of giving the teacher some ideas for developing questions and other devices to provoke thought and discussions.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
2.1	Self-Concept	Define the term "self-concept," and explain how our self-concept influences our behavior.	Here are some examples of the kinds of questions teachers could ask to help students analyze and clarify their values related to driving behavior.
2.2	Young Drivers	Given a list of traits that influence driving performance, identify those which tend to characterize young drivers.	What assets do young drivers have over their parents? What liabilities? How can these liabilities be minimized? How do you account for the fact that young drivers have a disproportionately higher share of accidents for their numbers?
2.3	Assets and Liabilities	Given a list of traits which influence driving performance, distinguish those that *promote* from those that *interfere* with competent performance on the highway.	What acts of expression have you noticed in others, triggered by the vehicle? What was the effect on driving and school performance? What does the vehicle do *to* you or *for* you? Does this influence help or hinder your driving and school performance? If you were a parent what rules would you set up for your son's or daughter's use of the car?
2.4	The Driving Environment	Explain why our highway behavior may be less personal than our behavior in other settings where we interact with people.	
2.5	Vehicle Influence	Predict the effect that motor vehicles will have on your life during the next five years.	
2.6	Improvement Factors	Indicate why some students following driver education will continue to move toward excellence as highway users, while others will show little improvement.	

Episode Delineation Form—(Continued)

2.7	Do-It-Yourself	Develop a set of practical guidelines for implementing a self-analysis and self-improvement program as a highway user	What traits mark the highly proficient (expert) driver? What are your main strengths as a driver? Your main weaknesses? What feelings or attitudes brought on by the vehicle would you like to discard or change? Is it possible for a person to change either his needs and feelings, or their effect on his driving? How? Would you state a way in which you might drive differently during the coming week—something which is under your conscious control? How many of you are willing to make this modification for one week, and then report to us next week on how this change affected your experiences on the road?
2.8	Safety *for*	Summarize your beliefs (philosophy) regarding "safety" as a value in competition with other values.	

CONTENT

2.0 Our proficiency level as operators can and should move toward excellence through self-evaluation and a continuing learning process.

2.1 The way we look at ourselves (self-concept) as persons and as drivers significantly influences our behavior.

a. When an operator understands himself, he is a better judge of what he can do and cannot do behind the controls.

b. Self-understanding also helps us to understand and anticipate the actions of other highway users–to realize that they have limitations also. (Their limitations may be different from ours.)

c If you see yourself as a courteous person, you will do courteous things; as a consequence you will probably be treated courteously by others (self-fulfilling prophecy).

2.2 Young drivers are most susceptible to accidents at the *time when they have the greatest potential* to be skillful.

a. May use the automobile to release tensions, restrictions and other frustrations associated with growing up.

b. Frequently they lack the experience and judgment to evaluate traffic situations accurately and decide the best course of action.

c. Driving proficiency of youth will be adversely affected by alcohol, passengers and other distracting factors–more so than with experienced drivers.

d. Young drivers often attempt maneuvers that test the limits of their fast reflexes and manual dexterity.

e. Young people tend to discount their weaknesses and assume that adult counselors are overcautious.

2.3 Some value elements promote and some interfere with both effective living and effective driving.

a. Creative forces leading to operator competence are acts of expression which reflect:

(1) pride in competent driving and a desire to improve;
(2) tolerance and courtesy toward the actions of other highway users;
(3) respect for traffic laws and enforcement;
(4) patience and alertness; and
(5) readiness to accept bad behavior from others without malice.

b. Certain value elements cause responses which interfere with effective performance as a highway user. Examples of these beliefs, attitudes and habits of thinking are:

(1) over-confidence,
(2) competitiveness,
(3) stereotyping other drivers,
(4) fatalism,
(5) feeling of immunity,
(6) making unreasonable assumptions about the actions of other highway users, and
(7) blame transfer.

c. Our needs and values are reflected in overt behavior, so we can tell something about ourselves *and others by what we see or hear on the* highway.

(1) Do we keep our car in good condition?
(2) Do we drive with enough concentration to recognize and avoid potentially hazardous situations or do we permit distractions outside the vehicle, within the vehicle, or within ourselves to interrupt our concentration?
(3) Rather than being upset by the errors of other operators, do we allow and compensate for these errors, realizing that at times we commit the same errors?
(4) Do we drive at a sensible speed and blend with traffic?
(5) Do we obey the rules of the road–or do we "run" lights, pass on hills and curves or commit other illegal and unsafe acts?
(6) Are we unobtrusive as a driver, or can you *hear* us because of excessive and inappropriate use of the horn, noisy exhaust, excessive tire squeal or blaring car radio?
(7) Do we treat the vehicle as a convenient and pleasant means of going places–or do we regard it as a toy for playing thrill games?
(8) Are we calm and alert even under difficult and frustrating situations as opposed to being nervous, impatient and irritable?
(9) Do we avoid driving when unfit for the task?
(10) Are we big enough to admit our mistakes in traffic, or are we inclined to rationalize or blame others?

2.4 The vehicle does not change you or your basic values, but the depersonalized nature of the driving environment may cause less courtesy, less tolerance, less friendliness and less of all desirable human qualities.

a. Specific attitudes toward driving are not an isolated part of the operator's personality, but rather a projection of it.

b. An operator becomes an extension of his vehicle, and tends to view other operators as parts of *their* vehicles, which has the effect of watering down the human feeling. (Tend to treat other drivers as "things.")

c. Vehicles provide avenues for the expression of the character, temperament and self-concept of the operator. (What does the vehicle do *to* you and *for* you?)

d. Driving an automobile is one aspect of contemporary life which makes it possible for persons to express hostility, discourtesy and emotional conflict without much fear of reprisal, and often with complete anonymity.

e. Responsible operators control their negative and destructive tendencies with positive and creative motives within themselves (self-discipline) despite their anonymity as drivers. Examples are:

(1) tolerance over retaliation,
(2) patience over impulsiveness,
(3) self-preservation over thrill seeking,
(4) responsible behavior over irresponsibility,
(5) courtesy over rudeness, and
(6) poise over panic.

2.5 Some young people become so absorbed in motor vehicles that they neglect school work and other responsibilities basic to their development.

a. Studies reveal that the amount of vehicle use by a high school student relates to academic standing.

b. Holding a job to support a vehicle can affect the student's attitude toward school.

(1) May lose interest in studies, athletics and other activities.
(2) Cuts himself away from an important part of the purpose and meaning of school life.
(3) May drop out of school.

c. The use of the family car(s) is an issue in many families which requires an intelligent and cooperative solution.

2.6 Driver education can only help you to establish a *foundation* upon which to build the characteristics needed for a successful driving career.

a. You will never know *all* there is to know about anything, and this is particularly true of driving. It is what you learn after you know it all that makes for excellence.

b. Your parents may be better drivers than you are, simply because they have more experience. However, experience does not assure the development of competency. Experience helps only when you learn from it. This explains why some older drivers are not capable of handling modern traffic conditions.

c. Young operators must develop judgment beyond their years if they are going to accept the responsibilities brought about by the power and freedom of motor vehicles.

d. In striving for excellence in driving, one competes only with himself. Satisfaction and rewards make the effort worthwhile.

e. Driving is a task worth doing *well* when you consider the number of hours you will spend behind the controls of a motor vehicle and the potential danger which accompanies this activity.

f. Learning to control the vehicle (motor skills) is relatively easy to learn, but learning to control yourself and the traffic environment presents a real challenge.

g. It is possible to be either a competent or incompetent operator with the same degree of knowledge and physical skill.

(1) A rather unskilled operator may still be permitted on the road if, on the basis of a strong feeling of responsibility, he adjusts the manner of his driving to the degree of his proficiency.
(2) On the other hand, no driver with adequate, or even exceptional skills, should be permitted to drive if his proficiency is not supported by a sufficiently developed social feeling of responsibility.

h. Competent driving is somewhat contingent upon the development of a sound personality, because the inter-personal reactions of the operator depend on his mental and emotional adjustment toward himself, other highway users, authority and other factors.

(1) Driving behavior simply reflects what kind of a person you are.
(2) The man behind-the-wheel is acting out the story of his personality.

2.7 Young people who are dissatisfied with the value element controlling their behavior, *can change.*

a. Undesirable value elements acquired in childhood can be discarded or modified because now you have more control over your environment and more opportunity to make decisions.

b. If you change some of your attitudes and feelings, the things that you do will change. (If you see traffic laws differently, you will behave differently.)

c. Unfortunately, your task will not be easy–attitudes remain until experience changes them and then tend to resist change.

(1) We tend to withdraw from situations–people, articles and experiences–that threaten our attitudes.
(2) Attitudes closely related to one's self-concept and self-esteem are far less easily changed than the non-ego involved attitudes.
(3) It's difficult to change an attitude that may mean rejection by social groups in which we are accepted, even though it is the intelligent thing to do. (Hard to stick your neck out but self-esteem will be increased if you do what you know is right.)

d. Nevertheless, if young people are serious about becoming expert in driving, they can devise and implement a do-it-yourself plan for improving their value structure and driving behavior.

(1) Examine your value indicators and decide which ones are assets and which ones liabilities. (Who is driving this car, I or an attitude that will cause me trouble?)
(2) Seek reliable information about the beliefs upon which your attitudes are based.
(3) Analyze the personal needs served by your antisocial and ineffective acts of expression, and then develop a substitute plan for fulfilling those needs. Social status can be promoted through traits which typify driving competency, since most groups value cooperation, responsibility, self control, courtesy and common sense.

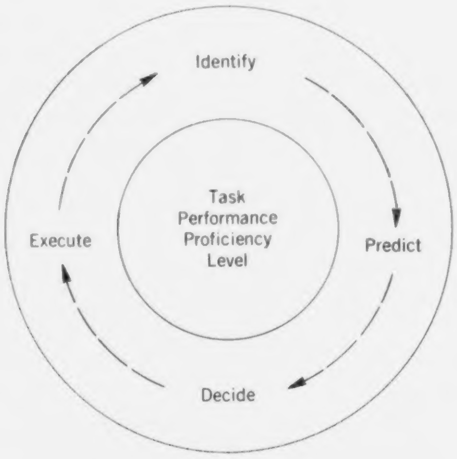
2.8 If a person is to realize a life of creative usefulness and personal fulfillment, he must perceive safety as a positive and dynamic value functioning in concert with other individual and social values.

a. Safety as a value at times competes with time, status and group pressures, personality shortcomings, loyalty, bravery, adventure and other values.

b. Safety enables us to choose between experiences that are unproductive, absurd and even stupid, and those that enrich our life, make it interesting and worthwhile.

c. Giving due regard to safety, as the operator of a motor vehicle, increases the probability for achieving life's short and long range goals. Safety is a means to an end–adventure, progress, achievement of goals. (Safety *for* as opposed to safety *from.*)

(1) Safe driving helps us to reach a certain destination to accomplish some purpose. By continuing to reach these destinations, with a good driving record, we maintain the privilege of driving the family car and eventually our own vehicle.
(2) Indirectly, the driving privilege helps us to accomplish other objectives, such as: making the band or the team, graduation from high school or college, achieving career aspirations, marrying and having a family, and enjoying other pleasant and profitable adventures of life.



OPERATORS LICENSE
INSURANCE
HIGHWAY SAFETY
POLICE
VEHICLE INSPECTION

SECTION III – IMPROVEMENT TASKS

Unit B – System Improvement

Unit Objectives:

Students will be capable of identifying their role, and assuming their responsibilities in a constructive manner, as they relate to traffic law enforcement, traffic engineering and other forces that dominate the highway transportation system.

Episode Titles:

1.0 Traffic Law Enforcement
2.0 Traffic Engineering
3.0 Suggestions, Guidelines, and Resources for Action

Episode Delineation Form

UNIT B Title: System Improvement
EPISODE 1.0 Title: Traffic Law Enforcement

EPISODE PURPOSE: Usually, a community has a quality of traffic law enforcement commensurate with the understanding, interest and support of the citizens. Therefore, in this episode, emphasis is placed on the benefits that individuals and society derive from traffic law enforcement, and how highway users can influence the quality of traffic laws, police traffic supervision and traffic courts. The ultimate purpose is to help students develop a mature sense of responsibility as they relate to the traffic law enforcement function.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
1.1	Kinds of Traffic Laws	Define the different kinds of traffic laws and describe their purposes.	Questions: Why do we have traffic laws? What different kinds of traffic laws do we have and for what purposes? Which laws do I need to know now? Under what future conditions will I need to know other traffic laws?
1.2	Conformity	Contrast the reasons for and the possible benefits to the individual of obeying versus disobeying traffic laws. (Rules of the road)	**Questions**–assigned for homework and then discussed in class. Why are traffic violations committed? Why do highway users comply with the law? How do you feel about obeying and disobeying traffic laws? **Analyzing traffic situations** where one or more law violations are committed. What violation(s) was committed? Why did the person violate? What are the potential consequences? What would you have done in this same situation?
1.3	Quality Enforcement	Given description of traffic laws and general enforcement measures in a community; identify the strengths and weaknesses of the program.	**Questions:** What characteristics must traffic law enforcement include if observance is to be widespread? How should we react to unreasonable traffic laws?
1.4	Police Traffic Supervision	Describe the functions of traffic police.	**Questions:** What duties have you seen traffic police perform? What equipment and training do they need to perform these duties? How do you feel about police using unmarked cars and radar to catch speeders? **Resource person:** A police officer discusses his duties, experiences and feelings.

Episode Delineation Form (Continued)

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
1.5	Violator-Police Relationship	When given a description of a police officer stopping a motorist for a traffic violation, including dialogue, (1) evaluate the behavior of both the officer and the violator and (2) hypothesize about the motivation which prompted the participants to behave as they do.	**Role playing:** A police officer stopping a driver for a traffic violation. **Questions:** Should police chase a driver who "runs" when directed to stop? What changes occur from childhood through manhood in attitude toward police?
1.6	Traffic Courts	Given a case description of a traffic violator appearing in court, evaluate the characteristics of the court and the behavior of the participants.	**Field trip:** A small group of students visit a traffic court session and report their findings to the class. **Role playing:** 1. Dramatize a traffic court session with students playing the roles of judge, violator, clerk, police officer and witnesses. The rest of the class serves as a jury. 2. A violator at the Violations' Bureau complaining about a $5.00 ticket. Class analyzes the attitudes of the violator.

CONTENT

1.0 Traffic laws and ordinances are designed to create orderliness, convenience and protection on our highways.

1.1 Traffic laws cover many subjects.*

a. Certificate of title and registration of vehicle laws serve as a proof of ownership, and, in addition:

   (1) protect you from purchasing a stolen vehicle;
   (2) aid enforcement officials in recovering stolen vehicles; and
   (3) help the police to locate you in an emergency.

b. Antitheft laws are designed to prevent unauthorized use of a vehicle, damaging or tampering with a vehicle, and other unwarranted acts.

c. Financial responsibility laws help to protect the public from the uninsured motorist.

d. Civil liability laws govern the civil rights of one party to collect damages from another party in the event of a collision.

e. Laws regarding accidents and accident reports specify the responsibilities of persons involved in accidents in order to minimize the consequences and to furnish data for proper settlement.

f. Vehicle equipment and inspection laws aim to prevent drivers from operating a vehicle on public highways which is in such unsafe condition as to endanger any person.

g. Laws dealing with highway administration are designed to create efficiency within and between various agencies and departments (federal, state and local) responsible for some phase of the highway transportation system.

h. Size, weight and load laws govern those features in order to minimize delay, danger and damage created by unreasonable sizes, weights and load of vehicles.

i. To protect the public from unscrupulous practices, a body of laws govern dealers, wreckers, rebuilders and owners of for-rent vehicles.

j. Driver licensing laws help toward insuring that only persons physically and mentally qualified may drive, and prevent unjustified denial of the privilege to drive.

   (1) Driver licensing laws furnish a social device by controlling and sometimes suspending or revoking the license of drivers who are not willing to respect the rights of others.
   (2) Driver licensing laws should provide for a driver improvement program based on a point system to assign a certain weight to different violations, with a plan to help problem drivers or restrict those who do not respond to driver improvement efforts.
   (3) Some of the most serious and willful violations carry mandatory revocation or jail sentence; for example: driving under the influence of alcohol or drugs; driving while under suspension or revocation; leaving the scene of an accident; and others.

k. Rules of the road establish specifications for conventional behavior so that highway users have some basis for predicting each other's behavior.

   (1) These rules of social conduct cover (a) obedience to and effect of traffic laws; (b) traffic signs, signals and markings; (c) overtaking and passing; (d) right-of-way; (e) pedestrian's right-of-ways and duties; (f) starting, stopping and turning; (g) speed restrictions; (h) serious traffic offenses; (i) stopping, standing and parking; (j) operation of motorcycles, bicycles and play vehicles; and (k) miscellaneous rules.
   (2) Rules of the road represent arbitrary standards of conduct which do not provide for variations in individual differences.
   (3) As a practical matter, generalized concepts are used to prescribe behavior in some situations, so the highway user's best judgment and decision-making capabilities are required to apply intelligently the generalities of the law to the reality of traffic situations ("reasonable and prudent"; "so close thereto as to constitute an immediate hazard"; "within the assured clear distance").

   (4) Uniformity reduces chances for misinterpretation and resulting confusion and delays.

1.2 Various factors can (or should) influence the responses of highway users to traffic laws.

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*Most of these laws can be integrated throughout the curriculum where they relate to a task.

a. Traffic violations are committed because operators and pedestrians are:

  (1) ignorant of the law or the details of its requirements;
  (2) preoccupied or distracted and inadvertently fail to comply;
  (3) physically or mentally deficient or affected;
  (4) intentionally disobeying the law (many possible reasons here).

b. Highway users comply with the law because:

  (1) they understand the law and approve its requirements;
  (2) the requirements of the law fit the operators' own standards of conduct and action;
  (3) of sheer respect for law regardless of personal wishes to act differently;
  (4) of pride in a clean record;
  (5) they fear the inconvenience, embarrassment or punishment that might result;
  (6) they wish to set a good example (parent or driver education teacher);
  (7) it is the "smart" thing to do.

c. Most operators are tremendously aware of formal law and restrictions imposed upon them on crowded highways, but the driver's anonymity and the legalistic nature of the traffic environment tend to depersonalize and diminish personal ethics and sense of duty with respect to the rights of others.

  (1) The motorist who is driving 40 miles per hour in a thirty mph zone knows that he is violating the law even if the street is clear and he may be endangering no one. But if he drives 30 miles per hour when the street is congested and it is dangerous to others, he thinks that it is all right because the posted limit is 30 mph. However, he is not observing his moral obligation or the basic speed law which imposes an obligation upon him to drive in a manner which will not endanger himself or others.

d. Conformance to traffic laws–in addition to decreasing the chances of an accident, fine, jail sentence, loss of driving privilege, or criticism and embarrassment–can produce positive gains for the individual.

  (1) peace of mind;
  (2) increased self-esteem;
  (3) parental approval resulting in more driving privileges;
  (4) pride in a clean record;
  (5) social approval, creating a better image of young drivers;
  (6) more enjoyment of driving when fear of apprehension is removed; and
  (7) increased probability of reaching your destination in time and without incident.

e. Major traffic crimes can result in serious and permanent consequences for the offender. (Motor vehicle homicide, neglect of duty following an accident, trying to outrun the police, illegal possession of beer or other alcoholic beverages in the car, drinking and driving afterwards, drag racing, reckless driving, "borrowing" a car without permission, and others.)

  (1) Your behavior on the highway can cost you the privilege of your driver's license.
  (2) Your chances for employment, and the opportunity to become prominent in business, industry and government, would be markedly reduced.
  (3) To carry through life the guilt of a highway homicide caused by your negligence would be a heavy burden.

f. Because adults at times act immorally, stupidly, unsafely and even viciously, this is no excuse for young people to follow suit. Human nature in general and traffic behavior in particular can and must improve.

1.3 Good traffic law enforcement, like any other kind of good government, depends upon the acceptance of responsibility by both officials and citizens.

a. It is each individual's job to evaluate and support good law enforcement in his community and elsewhere. We are members of the community that enacted the law.

b. The deterrent aspect of traffic law enforcement will be effective to the degree that highway users:

  (1) understand the laws;
  (2) believe in the reasonableness of the laws (unreasonable laws are an obstacle to traffic movement and in addition breed disrespect);
  (3) believe in the likelihood of being detected and apprehended if they violate; and
  (4) believe in the certainty and adequacy of the penalty which will result.

c. We are under the eye of enforcement for a relatively small percentage of the time we are on the highway; therefore, our own desire and conscience is the most practical policeman. This means accepting and adopting certain disciplines and practices which we perform as a matter of our own compulsion.

d. The responsible person obeys unreasonable as well as reasonable traffic laws, but works through appropriate channels towards revising the unreasonable.

1.4 The role of police traffic supervision in highway safety is the same as in other phases of law enforcement: the protection of life and property and the preservation of order.

a. Traffic police accomplish this mission through:

(1) enforcement of traffic laws–to protect the highway user from his own unlawful behavior and that of others, the police officer is duty-bound to detect, apprehend and aid in the proscecution of traffic violators;
(2) investigation of traffic accidents; and
(3) the direction and control of traffic (at busy intersections, sports events and other special occasions, and in emergency situations police officers expedite the movement of traffic by personally directing drivers and pedestrians).

b. In addition they provide a variety of services designed to facilitate the safe and efficient movement of traffic.

(1) A portion of the traffic officer's time is spent in servicing and assisting the motorist who has a flat tire, empty gasoline tank, spilled load, and other troubles. These conditions interfere with traffic flow and often jeopardize the affected motorist and other highway users.
(2) In addition to protecting the highway user, the police officer also has a responsibility for protecting the highway from damage, misuse and litter.
(3) As voluntary compliance with the legal requirements of driving increases, the need for police traffic supervision decreases, so police officers encourage compliance by informing highway users of laws, hazards and consequences of illegal acts. (Press, radio, television, schools, etc.)

c. To realize the potential of police traffic supervision, reflected in the preceding stated functions, society needs nothing less than an adequate number of carefully selected highly trained men with vehicles and modern scientific devices for enforcement, accident investigation and traffic flow regulation.

1.5 If we think and act as a responsible person when accosted or directed by a police officer, we help the officer, the community and ourselves.

a. The most stupid and dangerous behavior is to run from the police because once the chase starts the officer has the right and the duty to follow no matter where you go. A chase can result in the senseless loss of life and property of innocent bystanders.

b. If ordered to pull over to the curb:

(1) do so immediately;
(2) if you disagree with the charges, state your position clearly and courteously, but do not be argumentative; and
(3) present your driver's license and sign the citation if requested. (This does not mean that you admit guilt.)

c. Remember that a police officer is authorized to investigate a car parked in "lovers lane" or another secluded spot since:

(1) carbon monoxide could be present;
(2) a robbery may have been committed in the area;
(3) a car could have been stolen;
(4) a mother may have reported that her daughter has not returned from a dance; and
(5) an escapee from a mental institution or a jail may be in the area. (Attacks by criminals on young people in parked cars appears to be increasing.)

d. If a police officer approaches, you have the advantage of knowing who he is (uniform, marked car, badge, gun), but he has no way of telling whether you are a criminal or the finest citizen. If you were the officer, think how you would react to a well-mannered young person compared to one who displays resentment and uses disrespectful language.

e. Reasonable allowances must be made for inevitable errors of judgment and normal traits of impatience and anger in the performance of police traffic supervision. (Police officers are human beings.)

(1) The job involves many frustrations and the officer may be reacting to the problem he had before yours. He may have just left the scene of a fatal or injury accident that resulted from someone doing what you have been stopped for.

(2) You will find an occasional "rotten apple" in police work, as in all vocations, but we err in condemning an entire department for the behavior of a few.

(3) We cannot justify repeating critical stories about police, or anyone, that are based on hearsay because these tales are often distorted or competely false (ticket quotas, speed traps, etc.).

f. No one needs to fear police action if he has committed no violation.

1.6 The distinctive function of traffic courts is to give fair and impartial justice to those arrested for traffic violations, but, like the police, their broad objective is to deter drivers from violating the law and to encourage voluntary compliance.

a. Unfortunately many people think that a judge's only function in a traffic case is to punish the violator, but a more important function is to improve drivers by helping them to understand the logic for traffic laws and convincing them to comply as a means of making our streets and highways safer (corrective penalization).

b. Traffic court judges are in a unique position to educate and correct the behavior of highway users.

(1) At the beginning of the traffic court session many judges present a brief talk designed to inform violators on the causes and preventatives of traffic accidents, with particular emphasis on individual responsibility.

(2) The competent judge also helps the alleged violator to see the unsafe and unintelligent aspects of his individual violation, so that he is more likely to conform to traffic laws in the future.

(3) When it appears to the court that a violator might benefit from a formal educational experience, the violator may be assigned to attend a driver improvement (traffic violator) school, either as the total penalty or as a portion of the penalty for the violation committed.

c. Experience in traffic court can make or break the individual's respect for the laws that govern his conduct on the highway, and also his respect for our judicial system in general.

(1) It is estimated that of all the people who appear before a court, 95 percent appear for traffic offenses, and in most instances their impressions gained from this experience is their only first hand knowledge of our judicial system.

(2) The driver who leaves the court with satisfaction and respect for the way his case was handled is less likely to return as a violator.

(3) Without effective working support of the courts, police-enforcement processes also tend to become lax or arbitrary thus creating disrespect for the entire field of traffic law enforcement. (Need for uniform interpretation, and adequate penalties; also, elimination of overloading of court dockets, "fixing", and favoritism.)

d. When court handling of violators is effective, when penalties are certain, swift, impartial and adequate, there is a community-wide benefit.

(1) Judges need the backing of citizen leaders and the public assurance that citizens want impartial handling of all traffic cases.

(2) The American Bar Association advocates citizens learning more about their judges and courts by engaging in a program entitled "Go To Court As a Visitor Not a Violator" (designed to stimulate citizens to work with the judge toward improving the court).

e. A person cited for a traffic violation and requested to appear in court to answer the charges, will be prepared to respond more intelligently if he understands the legal process.

(1) Usually the defendant receives a summons or citation called a ticket, which will indicate where and when he is to appear.

(2) Sometimes the case can be "disposed of" by mail or by appearing at the Violations Bureau.

(3) If the case is handled in court, the violator (defendant) hears his rights before the court and the exact charges against him and is asked to plead guilty or not guilty.

(4) Pleading "guilty" is the same as saying "I did what is charged", and usually carries a penalty of a fine, imprisonment or an adjournment to attend a driver improvement school. Do not plead guilty just because it is the cheapest or easiest way out at the moment.

(5) If the defendant pleads "not guilty", the judge then determines a time for the trial where the evidence will be presented. It may be immediately.

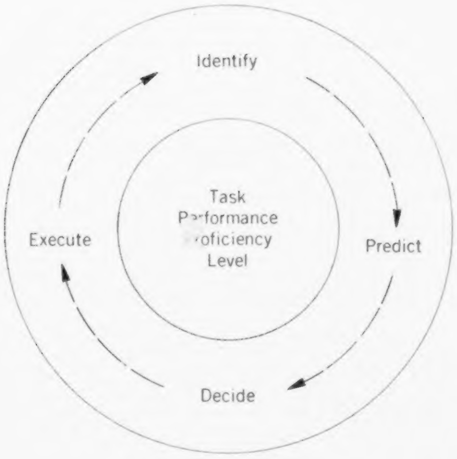
(6) The defendant may have his case continued until a later date in order to prepare his defense and/or to obtain a lawyer. This request must be made when the defendant is first called to the bench.

(7) To prepare for trial you should: analyze the statute or ordinance under which you are charged; interview any defense witnesses and require, in advance, their attendance at the trial; and organize your defense in a logical manner.

(8) At the trial, which may be before the judge only or before a jury, the defendant has the right of cross examination and the opportunity to present his side of the case, following direct presentation of evidence by the prosecution. Be brief and do not argue with witnesses or the prosecution.

(9) After both sides have presented their case, the judge or the jury decides guilt or innocence.

(10) The defendant has the right of appeal from any decision which he feels is wrong or unjust.



Episode Delineation Form

UNIT B Title: System Improvement
EPISODE 2.0 Title: Traffic Engineering

EPISODE PURPOSE: The purpose of this episode is twofold. First, an understanding of the roadway, and the problems that the traffic engineer faces in regards to the roadway, can be helpful to the beginning driver in understanding his task. (Traffic engineering can make it easier for drivers and pedestrians to avoid mistakes.) Secondly, if one of the goals of driver and traffic safety education is to produce informed and active participants (beyond driving) in the highway transportation system, then the students should be exposed to the traffic engineering function and problems.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
2.1	Traffic Engineering Function	Define traffic engineering and classify the functions performed by traffic engineers.	Teacher-led (or traffic engineer) discussion following a reading assignment. Students classify examples from their community to illustrate the traffic engineer's "handiwork."
2.2	Development of Traffic Engineering	Identify the key events in the history and development of traffic engineering.	Teacher-led presentation following a reading assignment.
2.3	Turbulence	Classify the factors which cause turbulence in traffic movement.	Students observe traffic movement at a peak period and classify the factors which impede traffic flow.
2.4	Uniformity	Describe traffic situations where lack of uniformity in a sign, signal or road marking could cause driver confusion.	Students present examples of "lack of uniformity" in signs, signals and markings which they have observed and how highway users were, or could have been affected.
2.5	Warrants	Identify the factors that traffic engineers consider in determining proper speed limits, and also the installation of signs and signals.	Students learn about warrants through a reading assignment, and then observe local situations to determine if recommended warrants were applied.
2.6	"Tools"	Given a spot map, collision diagrams, flow maps and other "tools" used by traffic engineers, interpret these devices by answering correctly a series of questions about them.	Teacher-led analysis of spot maps, collision diagrams, condition diagrams, flow maps, speed charts and before and after accident records. Student committees, working closely with the local traffic engineer, conduct intersection studies and prepare a report which includes (1) condition, collision and flow map diagrams (2) a written explanation of their findings and (3) proposed recommendations.
2.7	Techniques	Given a series of highway scenes (rural, urban and freeways), suggest (hypothesize) ways to improve traffic flow and safety with relatively inexpensive techniques.	Evaluate various measures used by traffic engineers to improve driving conditions–one-way streets; turning lanes; parking restrictions; pavement markings; removal of near-roadway hazards; etc.
2.8	Public and Individual Rights	Summarize the problems created in locating a new highway and how government attempts to ease these problems.	Teacher-led presentation following a reading assignment. A taped recording of an open hearing on the location of a new highway.
2.9	Pressures on Traffic Engineers	Identify the problems traffic engineers face in implementing sound ideas, and in rejecting unsound suggestions from various sources.	Taped or classroom interview with traffic engineer to find out what obstacles interfere with the achievement of these objectives. This interview could also include a discussion of the basic concepts in the preceding segments (2.1-2.8).

CONTENT

2.0 The traffic engineering function directly and persistently affects the highway user's (driver and pedestrian) tasks.

2.1 Traffic engineering – a specialized branch of engineering – deals with the planning, geometric design and operations of streets and highways as their use is related to safe, convenient and economical transportation of persons and goods.

a. Operates on the principle that official responsibility does not end with the building and maintenance of roads, but that efficient operation of those facilities is also a responsibility of government.

b. The traffic engineer is involved in the development or redevelopment of entire street systems, in the design of a specific roadway, and in using traffic control devices to assure the best use of roadways, new or old. (The best remedy is the one that corrects the situation with the least interference at the least cost.)

c. Where funds are not available for the correction of hazards through reconstruction, the traffic engineer must rely upon the use of traffic control devices to warn motorists of these hazards.

d. The quality of our highway transportation system in the future depends in large measure on the "needs" studies and planning of today. The traffic engineer is part of a team of specialists involved in that kind of planning. These specialists must consider:

(1) how land is presently used and forecasts of future use;
(2) present traffic patterns and future patterns (based on present and future land usage);
(3) limitations in the existing transportation system;
(4) predictions of future development in vehicle design and capability; and
(5) driver characteristics and limitations.

2.2 Traffic engineering as a professional specialty is rather new, but the concept of regulating traffic movement or operation pre-dates the introduction of the *motor* vehicle.

a. Caesar forbade vehicles in the central districts of Rome, and decreed one-way streets and parking regulations for chariots.

b. The building of highway facilities (highway engineering) apparently was highly developed in ancient times, and some of the old Roman military roads can be seen today.

c. The first professional traffic engineer came upon the scene in this country about 1922.

d. Not until the 1930's did the science and art of traffic engineering become developed and only in recent decades has its importance and technology been well understood and accepted.

2.3 Turbulence in the traffic stream (stops, starts, changes of speed and direction) reduces street capacity and is one of the most important single causes of vehicle-to-vehicle accidents.

a. The flow of traffic over a network of streets can be compared to the blood stream in the body–any blockages or other irregularities affect the smooth flow not only at that location but throughout the system.

b. Unnecessary traffic signals, signs, parking and other conditions which disturb the smooth flow of traffic should be eliminated.

c. Differences in speed cause vehicle-to-vehicle friction, which justifies the use of minimum as well as maximum limits.

2.4 National uniformity of signs, signals and markings is essential if we are to reduce confusion, and increase voluntary obedience, on the part of the motorists.

a. Traffic signs should be uniform as to application, shape, color and message, and also be reasonably uniform in size and location.

b. Pavement markings, especially those used to designate such regulations as no passing zones, must be uniform as to color and application.

c. Lack of maintenance of signs and markings encourages disobedience of these devices.

2.5 Stop signs, yield signs, and traffic signals installed at *warranted* locations assign right-of-way, reduce accident severity and certain types of accidents, and improve traffic efficiency, but unjustified poorly designed or improperly operated signs and signals can markedly impede traffic movement, increase accidents and breed disrespect for traffic control devices.

a. The judicious use of speed zoning can aid in getting operators to conform voluntarily to speeds which are suited to changing physical and traffic conditions.

  (1) The 85th percentile serves as a criterion for determining speed limits (a speed under which 85 percent of the vehicles travel).
  (2) Studies have shown that traffic speeds are not much affected by posted speed limits, possibly due to the fact that so many posted speed limits are unreasonably low.

b. Traffic engineers have devised warrants to guide their decisions about the installation of traffic lights.

  (1) Warrants take into consideration the volume of vehicle and pedestrian traffic, and the ratio of traffic between the intersecting streets.
  (2) Traffic signals are not unmixed blessings insofar as safety is concerned – they ordinarily reduce right-angle collisions and increase rear end collisions.

c. Stop signs should be used where necessary, as based upon a study of physical and traffic conditions at the location.

d. Yield signs can be used to assign right-of-way at low volume intersections where visibility is good.

2.6 Tools used by traffic engineers for studying and evaluating high accident locations are:

a. *spot maps* - furnish a quick visual index to concentrations of accidents which warrant detailed analysis;

b. *collision diagrams* - show the approximate paths and movement patterns of vehicles and pedestrians involved in collisions;

c. *condition diagrams* - a scale drawing of the important physical conditions at a location to be studied;

d. *flow map* - indicates the volume and direction of traffic?

e. *speed chart* - shows the speed of vehicles approaching the hazardous location?

f. *before and after accident records* - furnish a means for evaluating the effectiveness of changes made;

g. *electronic data processing* - use of computers to analyze accident data and link data with highway, vehicle and driver information.

2.7 Fortunately, no community has to accept traffic chaos and its penalties (reduced retail sales, lower property values, slowed down community development), because specialists are available who can apply proven traffic engineering techniques to the traffic ills of a community.

a. A major concern of the urban traffic engineer is the development of a system (or network) of principal traffic streets. Given adequate resources and support, he can accomplish this with the help of such tools as:

  (1) traffic signal systems which are coordinated to provide a smooth flow of traffic under changing volume conditions;
  (2) separate traffic lanes for loading, unloading or transferring passengers at transit stops;
  (3) additional traffic lanes on approaches to signalized intersections to facilitate turning movements;
  (4) channelization of traffic;
  (5) one-way streets;
  (6) prohibition of turning movements where it is necessary to increase the capacity of an intersection, or installing special turn intervals (the latter technique takes time ordinarily used for through movements);
  (7) pedestrian and highway grade separations in extreme cases to relieve bottlenecks at complex intersections; and
  (8) prohibition of curb parking (the permitting of parking on major streets is outmoded, but may require the establishment of off-street parking if it is removed).

b. Rural roads need to be modernized to handle the volume and speed of today's traffic. Many of the following improvements are relatively inexpensive and only require the understanding and motivation of state and county engineers supported by knowledgeable and concerned citizens.

  (1) Greater visibility can be obtained across corners at intersections, at sharp curves and at railroad grade crossings by cleaning out shrubbery, removing or relocating signs, etc.
  (2) Eliminating steep side slopes and deep ditches, and replacing obsolete guard rail, will decrease the severity of run-off roadway accidents.
  (3) Correcting road surfaces having high crowns or which are slippery when wet will help drivers maintain control of their vehicles.
  (4) Removing or setting back physical obstructions which are close to the roadway can eliminate a fixed-object hazard and also increase sight distance (mail boxes, trees, poles, signs, etc.).

(5) Substituting modern directional signs for undersize, non-standard, low signs will improve sight distance.

(6) Competent persons should lay out the passing and no passing center lines, so they are reasonably accurate aids for the driver.

(7) Sufficient lane widths for modern traffic are needed to help prevent head-on, side-swipe, and run-off-roadway accidents.

(8) A few dollars for reflective paint can help reduce accidents at danger points like bridge abutments.

(9) Rigid sign supports which injure motorists when hit can be replaced by breakaway posts that will safely give way on impact.

(10) Over-sized warning signs sometimes reduce the hazard at high accident locations.

(11) Level of safety could be improved if dangerous portions of rural highways were properly lighted (curves, intersections, bridges, overpasses, underpasses, tunnels, interchanges, elevated and depressed areas, etc.).

(12) Motorists are helped by the use of advisory speed signs located just below curve signs, when they are based on actual study of conditions.

(13) Eliminating or reducing excessive curvature; increasing visibility at hillcrests; and providing frequent sections where motorists have enough clear sight distance to pass with safety are costly but necessary improvements if rural two-lane roads are to be improved.

c. The freeway type of design required on the Interstate System demonstrates that many types of accidents can be reduced or eliminated through fully controlled access; wide median strips; grade separations; acceleration and deceleration lanes; adequate sight distances; wide shoulders; roadside clear of obstructions; flat drainage slopes; no traffic lights, parked cars or pedestrians; and slow moving traffic prohibited.

(1) In addition the freeway design takes cognizance of the fact that a driver can assimilate only a limited amount of information and he needs sufficient time to perceive and act on it. (A maximum of three destination points on one sign and the sign is usually placed one-quarter of a mile to two miles ahead of where he needs to take action.)

(2) The traffic engineer has not devised a way to protect the driver completely from rear-end and run-off-roadway collisions, short of making him fully obsolete as far as car control is concerned. (Unfortunately, it will be a long time before there are even a limited number of miles of "automated" highways upon which electronic guidance equipment in the vehicle and the roadway take over.)

2.8 In locating new highways both individual rights and the rights of the public must be protected.

a. Before the location for a new highway is finally decided upon, public hearings are held to give people the opportunity to hear the facts and to voice objections if there be any.

b. Those people who must move suffer inconvenience and sometimes hardship, but highways have to be located to serve the needs of all the people. (Every effort should be made to reduce the inconvenience and eliminate the hardship.)

c. New and improved highways increase business overall.

2.9 A traffic engineering department needs to be adequately staffed, assigned primary responsibility for traffic control, and backed up with sufficient authority to make decisions hold.

a. Traffic engineers experience pressures from individuals and groups motivated by selfish interests.

b. Traffic engineers are targets for criticism and advice of well meaning but badly informed "traffic experts".

c. Knowledgeable citizens can aid the traffic engineer by helping to stop rumors and misdirected actions by uninformed people who believe they have a solution to some phase of traffic engineering.

Episode Delineation Form

UNIT B Title: System Improvement

EPISODE 3.0 Title: Suggestions, Guidelines And Resources For Action

EPISODE PURPOSE: This episode relates to the *Introduction* Segment 1.7. There it was suggested that some teachers would like to involve students in a term project designed to improve some element in the system. The principles and procedures presented here can serve as guidelines for such a project, as well as motivate and prepare students for subsequent involvement.

The good citizen in a democratic society is one who works with his fellows in terms of common interests and problems, and also makes his unique contributions to society through his special talents and abilities.

Objectives and content in this episode are based on the assumptions that:

1. Individuals functioning alone, in small groups, or aligned with a civic organization can influence the decision-making process in highway traffic.
2. Qualified Driver and Traffic Safety Education teachers can stimulate enough concern to arouse student interest in bettering the highway traffic system.

Emphasis is placed on the avenues (to the decision makers) and measures open to informed citizens (youth included) who would like to support and instigate legitimate action to improve the components of the system.

Seg	Concepts	Objectives–Student Behavior	Learning Activities & Resources
3.1	Suggestion and Guidelines	Given a list of specific deficiencies in highway traffic system components, with alternative procedures for a private citizen to follow to initiate or support action for correction of the deficiency, select the more appropriate alternative.	As suggested in the *Introduction* (1.7), the following learning activity would need to be started rather early in the course. Teacher-led presentation on guidelines for becoming involved in an activity designed to improve the highway traffic system. Next, students are requested to identify what they feel are deficiencies in highway traffic conditions in their community and suggest tentative solutions. These solutions are then evaluated by other students, the teacher and possibly resource people (police, engineer, etc.). Finally, students, either individually or as a committee, select a term project which promises to improve some element of the traffic program in their community or state. Under close supervision of the teacher, and with full knowledge of public officials responsible for the part of the system touched by the project, students proceed to: 1. design the project; 2. gather data; 3. interpret the findings; and 4. prepare a report for the class, and in some cases, a wider audience.
3.2	Development and Management Forces-Component Classification	Classify the various government, business, industrial and educational forces involved in developing and improving the major components (man-machine-roadway) of the highway transportation system.	Charts and written explanation of the many interconnecting forces directly concerned with the highway transportation system will provide students with prerequisite knowledge needed to carry out the learning activity in 3.1, and to relate more effectively to the system as an operator and non-operator in the future.

CONTENT

3.0 Private citizens can influence the development and management of the highway transportation system.

3.1 Our responsibility with respect to the highway transportation system extends beyond what we do as vehicle operators; it includes non-operating activity that contributes to overall system efficiency and improvement.

a. Regardless of occupation or status, in a democratic society channels are open for concerned citizens to voice opinions and suggestions regarding public problems.

(1) Help to stop rumors, myths and misdirected actions by uninformed citizens with good intentions, who think they have a solution to some phase of the traffic problem. You will find that many people believe they have a simple solution to the complex public problem of traffic safety.

(2) Seek out information on the needs, problems and plans of local and state traffic officials and help them to gain support for sound programs by (a) exercising your voting privilege, (b) directly influencing individuals and groups with whom you associate, (c) working through traffic safety councils and other citizen support organizations, or (d) making a personal appearance before a county board of supervisors, or a state legislator to explore an opinion about what should be done. (Be well informed!)

(3) You will have the opportunity to vote for or against public officials at all levels, and in doing so, consider their apparent degree of interest in improving the highway transportation system.

(4) Complaints, compliments and suggestions regarding state administered programs (vehicle inspection, driver licensing, etc.), can be sent directly to the responsible state officials or to a state legislator.

(5) Become informed about proposed state and federal legislation related to highway transportation, and help legislators make wise decisions with respect to traffic legislation by informing them of your views. Legislators report that rarely do they hear from their constituents regarding traffic safety matters.

(6) Individually, or as a member of an organization, you can communicate ideas and suggestions regarding federal standards on traffic safety to the National Highway Safety Bureau or to your U.S. Congressman.

(7) Communicate complaints, suggestions for improvement and compliments regarding your vehicle to your dealer, the manufacturer or to the National Highway Safety Bureau.

b. Before embarking on an effort to improve an element of the highway transportation system, the responsible individual seeks out reliable information concerning the forces impinging on the problem so that he recognizes his legal and moral responsibilities related to the agencies and programs involved. (See 3.2 for a listing of these.)

(1) The more closely we become involved with a public question, the more personal it becomes and the less rigid we learn to be about it.

(2) Facts as well as good intentions are needed if problems are to be solved, otherwise, citizen support may represent a pooling of ignorance that interferes with progress.

(3) Traffic safety is too large to comprehend, much less solve, in one "fell swoop", but if we work on manageable elements under a coordinated plan observable progress can be accomplished. (A safer intersection; more orderly traffic and parking around the school; a better traffic court; a qualified driver education teacher; first aid training for ambulance drivers–each contribute to system efficiency and effectiveness.)

(4) Highway safety officials are working on a *public* problem and, therefore, are obligated to balance the needs and desires of special interest groups with those of the public at large and make decisions on the basis of what is best for the system. Good reasons may be present for not making the change *you* believe is needed.

(5) Resources are limited, therefore, decisions regarding the expenditure of public funds for improving the highway transportation system must be weighed against the demands for other public programs.

c. Sometimes an individual operating alone can stimulate action quickly and effectively, but more often the individual needs to enlist the support of other individuals and groups and enthuse them about the matter.

(1) The good traffic citizen responds to others and operates jointly with them toward the goal of a better highway system.

(2) Working with others toward a common goal is a stimulating experience.

(3) Examples of individuals and groups that may be interested in carrying an idea forward are classmates or colleagues, driver education and other teachers, youth groups, service clubs, Junior Chambers of Commerce, mass media, local traffic safety organizations, public officials, and legislators.

d. High school students need not wait until they are adults before contributing time and talent to improving the highway transportation system.

    (1) Suggest and help arrange for qualified traffic officials to speak to the organizations to which you belong.
    (2) Express your views about traffic safety around the school or in a community through letters to the editor of your school and community newspaper, radio and television stations or magazines.
    (3) Help the driver education teacher to identify the most meaningful content and methods for influencing young drivers.
    (4) Report hazardous highway and traffic conditions in your community to the proper authorities. (Examples of such conditions are: a bad chuck hole, obstacles to vision, confusing signs or markings, and other conditions which obviously impede safe and expeditious movement of traffic.)

e. As an adult your potential contribution to an improved highway transportation system will depend somewhat on your chosen career. (The good citizen in a democratic society makes unique contributions through his special talents and abilities.)

    (1) A physician is in a good position to advise patients regarding the relationship of physical and mental health to driving behavior, and cautions to be employed if ill, handicapped or using prescribed drugs.
    (2) A teacher of any subject at any level has an opportunity to influence student knowledge and values related to the highway system and driving behavior.
    (3) An individual in the athletic and entertainment world has an opportunity to influence the traffic related behavior of those who respect his talent.
    (4) A legislator, a county commissioner, a city councilman are in a particularly strong position to exercise leadership in highway traffic safety.
    (5) Those engaged in mass communications (press, radio, TV) can reach large numbers of people with traffic safety information.
    (6) Many career opportunities are open to those who choose to work directly in the field of highway safety management as a researcher, professional, administrator, supervisor, specialist, technician or driver.
    (7) Opportunities to make a significant contribution to traffic safety will come also when you are a parent through your (a) example as a driver, (b) attitudes and actions toward traffic officials, and (c) ability, as a parent, to develop individual and social responsibility in your children.

f. Participating in programs to improve society, particularly in an activity as important as traffic safety can help us:

    (1) to identify with others;
    (2) gain status and recognition with our peers;
    (3) acquire self-esteem;
    (4) demonstrate our maturity; and
    (5) to "feel good" about being part of the solution to a public problem.

3.2 Many forces are at work to improve highway facilities, traffic movement, vehicle performance and highway user performance.

a. The construction and maintenance of highway facilities, and the control of traffic on those facilities, represents a huge task involving a multitude of resources.

    (1) The U.S. Department of Transportation, through its Bureau of Public Roads, administers the federal-aid highway program and, in in cooperation with state highway officials, establishes standards for highway design, construction and maintenance.
    (2) State, county and municipal road departments control the building and maintenance of roads not under the Federal-aid system.
    (3) U.S. Congress, state legislatures, and local government bodies appropriate the funds for building and maintaining roads. (Derived for the most part from the highway user taxes on gasoline and oil, vehicle license fees and excise taxes on tires.)
    (4) Federal, state and a few local governments employ traffic engineers who are responsible jointly with the police and highway patrols for the safe, convenient and rapid movement of highway traffic.
    (5) Private engineering consulting firms on a contract basis play a prominent part in planning, design and operations phases of the highway systems.
    (6) Universities conduct research related to highway construction and traffic movement, and also offer educational programs for highway safety and engineering personnel.
    (7) Junior colleges include pre-service and in-service educational programs for traffic engineering technicians, police and others. (However, there is far too little training and education of highway safety personnel in junior colleges or other educational institutions.)

(8) Industry and business—through foundations, boards, institutes, etc.—support research and educational activities designed to improve highway facilities and traffic flow.

(9) Road building is big business, heavily involving concrete and asphalt companies, sign and signal manufacturers, and other segments of the business and industrial world.

(10) Numerous official and non-official safety organizations influence highway facilities through the legislative process, public support and other means.

b. The design and operating condition of the vehicles used in the highway transportation system depends upon various factors.

(1) In large measure the automotive and allied industries determine the design and operating characteristics, and the reliability of vehicle performance.

(2) The National Highway Safety Bureau has the authority to specify standards for new and used vehicles which (a) simplify the driving task, (b) make the vehicles more crashworthy, (c) improve vehicle operating characteristics, and (d) give additional protection to vehicle occupants.

(3) Each state has a motor vehicle registration program which furnishes rapid identification of each vehicle and owner; and most of them protect the title and ownership of the owner(s).

(4) State statutes specify certain minimum safety equipment standards for motor vehicles operating in that state.

(5) State and local vehicle inspection programs are designed to check periodically and assure correction of defective vehicle components affecting safe operation.

(6) Commercial organizations and governmental agencies operating large fleets of vehicles have carefully planned vehicle maintenance programs.

(7) Universities, through grants from industry and the federal government, augment research carried on by the automotive and parts industry to improve the safety and efficiency of automobiles.

(8) Junior colleges, technical schools and the automobile industry train auto mechanics. (A serious shortage still exists.)

(9) Automobile agencies sell new and used cars, and also provide maintenance service to owners, and thus influence the quality of vehicles on our highways.

(10) The quality of vehicle maintenance work done by independent garages plays an important part in vehicle performance and safety.

c. Many agencies and institutions strive to influence the behavior of highway users.

(1) The National Highway Safety Bureau sets standards for state highway safety programs related to driver education, driver licensing, codes and laws, police traffic services, traffic courts, motorcycle safety, alcohol in relation to driving and numerous other areas.

(2) Professional associations establish policies and recommendations, develop materials and provide other services to stimulate and improve the behavior of highway users.

(3) State departments (motor vehicle, education) are responsible for administering laws related to driver licensing and driver improvement, driver education and school bus transportation.

(4) Elementary and secondary school curricula include the teaching of concepts designed to improve the behavior of highway users of all ages, as well as driver education specifically.

(5) Colleges and universities affect the behavior of highway users by preparing traffic professionals (police, judges, engineers, driver education teachers), and also by conducting research on driver behavior and teaching methods.

(6) Traffic laws are established by state legislatures and ordinances by city councils to influence and control the behavior of drivers and pedestrians.

(7) State police or highway patrol, city police, sheriffs and other police agencies serve as a deterrent to illegal and unsafe behavior on the highways.

(8) Many different kinds of courts at various levels of government determine guilt or innocence and impose penalties upon those who are convicted of traffic violations.

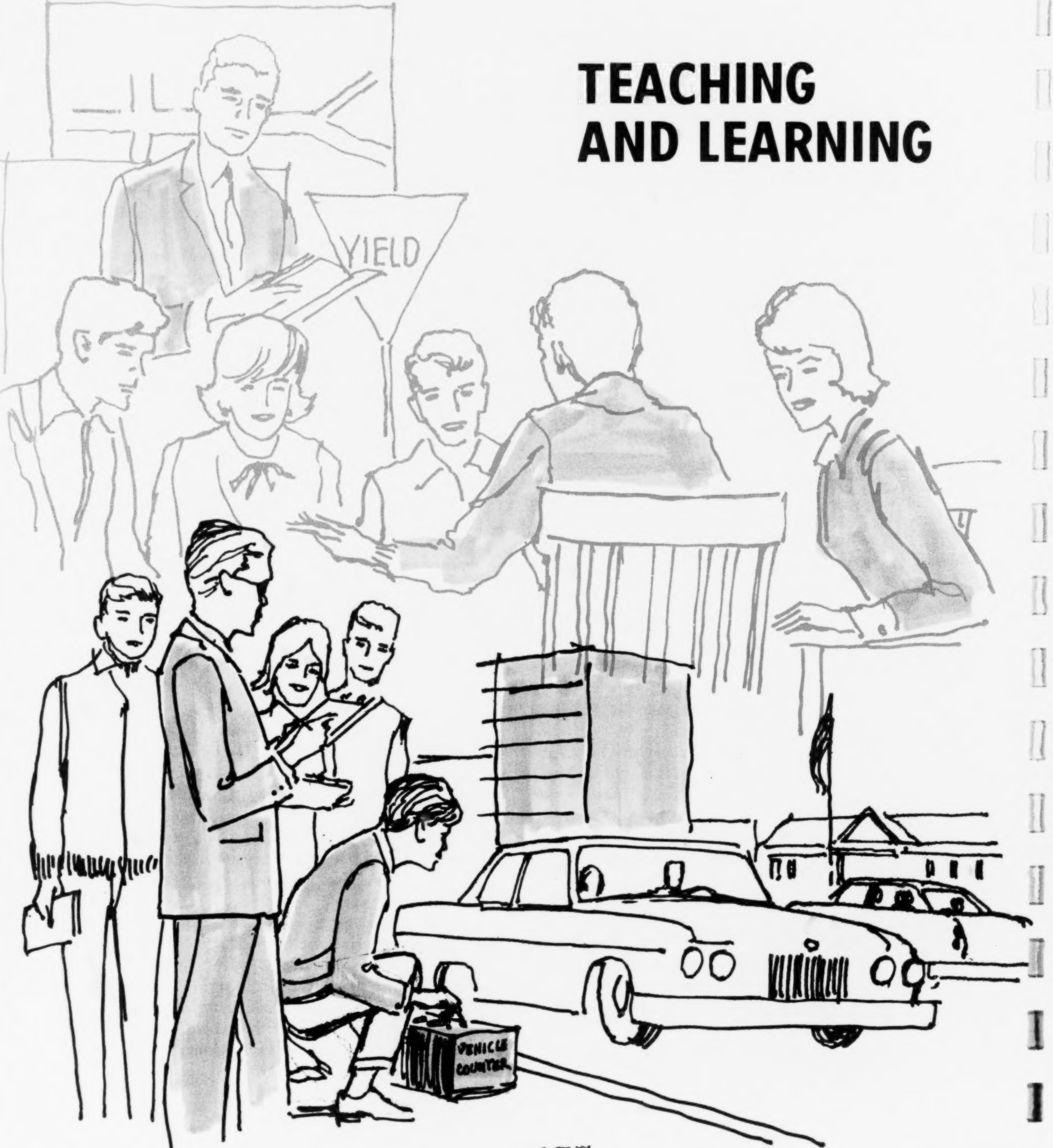
(9) Industry and business support foundations, institutes, councils, etc. that conduct activities directed at improving the behavior of highway users.

(10) Mass media (press, radio and TV) use their resources to influence the behavior of drivers and pedestrians.

(11) The armed forces, commercial transportation, and other groups employing large numbers of drivers conduct their own driver-training programs, sometimes engaging the services of outside consultants.

PART IV

TEACHING AND LEARNING


YIELD
VEHICLE COUNTER

TEACHING AND LEARNING

Dr. Arthur W. Coombs, social psychologist at the University of Florida, in his writings and speeches, reminds us that learning is a human problem having two parts to the equation. One part is acquiring new information and the second part is discovering personal meaning for the new information *so that one behaves differently*. We have become quite proficient in achieving the first part of the equation, aided by films, educational television, overhead projectors, computer assisted instruction and other devices. Now we must learn to use these devices, and other teaching strategies, to accomplish the second part of the equation.

The personal meaning concept is particularly relevant to driver and traffic safety education. Students can make a perfect score on a "rules of the road" written test and then proceed to violate every one of them. Therefore, teachers must cultivate a style of teaching effective in getting "under the skin" of students so they behave differently as a result of the learning experience. The following discussion presents some hypotheses about how that result might be achieved.

Challenging Students Through The Competency Motive

DTSE* will be effective to the degree that it is successful in cultivating the admiration of, and confidence in, intelligent and skilled performance with respect to traffic related behavior. Almost every young person is highly motivated to drive, but the teacher's challenge is to use this intrinsic desire as a springboard to helping young people acquire a complete and accurate picture of their role in the highway transportation system. The student must view traffic as an adult activity requiring all of man's powers of observation, judgment, decision-making and performance abilities. Then we must demonstrate to youth, the positive methods that will help them to acquire the capabilities needed to function as competent individuals. Fear of an accident, fear of legal punishment and other negative forces are good methods of restraint, and almost everyone at times needs these emotional repulsions. They should be used to break up bad habits, and to restrain the recklessness of overadventurous drivers. However, they do not create anything. Building up expert performance is founded emotionally on the positive attraction of skill, self-control, responsibility, maturity, good sportsmanship, accurate thinking habits, empathy and competency itself. Perhaps we err in emphasizing the driving competence as an end. In some cases it might be, for example, to the youth who received an award for good driving, or the commercial driver who received an extra bonus for rolling up so many miles of accident-free driving. But under most conditions driving competence serves as a means to ends, such as increased mobility and independence, and increased probability of achieving short and long range aspirations. Furthermore, interest, pleasure and satisfaction increase as we become more proficient in a given task. These are the reasons for becoming the best that one is capable of becoming as a highway user and traffic citizen.

Inquiry As A Teaching Strategy

Most of the "content" in this study appears in the form of generalizations that need to be developed or "discovered". In some cases the most efficient way is to start with the generalization and proceed to develop it with supporting generalizations and facts. Teaching the concept of hydroplaning is an example. It took years for anyone to "discover" this concept as it applies to vehicular driving, so the teacher would simply use illustrative materials and appropriate techniques to help students internalize the meaning of the term and the implications for driving behavior.

In other cases students should be guided through an inquiry process to formulate generalizations which they find meaningful in light of their experiences. An inquiry approach to learning begins with a situation, problem or question that arouses the student's curiosity. The next step is a statement, in general terms, of an explanation or solution. This statement is called a hypothesis. Now, the class and the teacher look for information or evidence to help support the hypothesis. If the evidence seems to prove the validity of the hypothesis, then a temporary or tentative statement (generalization) is made. The class then may look at similar problems and see if the generalization can be applied to other situations. Obviously, such a reflective process occurs only in a climate that affords freedom for the student to explore, test ideas, make mistakes and ultimately "discover" new insights.

When using inquiry in the classroom the teacher takes on a new role. In addition, to "setting up" the inquiry, he supplies continuing stimulus, support and guidance along the way. His main objective is to help the students see the range of alternative points of view or ways of dealing with a problem. Although students must be encouraged to doubt and question, the teacher must guide them toward realistic assessments and away from snap judgments and panaceas. In so doing, however, he should avoid making harsh judgments of student responses, or students will respond only when they feel sure of the "correctness" of their remarks (or will not respond at all). Such a consequence diminishes the learning potential of the process. Instead, the teacher has to create an atmosphere in which the students feel that their ideas and opinions are considered worthwhile and valuable.

The multiple cause concept (See Section I, Unit D, Episode 1.0) will be used to demonstrate how the inquiry method could take place in driver and traffic safety education.

First, the teacher presented the class with a diagram and verbal description of a one-car, run-off-roadway type of traffic accident. A police report said "excessive speed" was the cause of the accident, but a more complete analysis revealed eight other probable contributing factors. After the students were given this information, the teacher asked "What is *the* cause of the accident"? Student responses covered the whole range of factors, but left the question unanswered. Finally, a student suggested that *the* cause is a *combination* of all the factors that contributed to the accident. The class then formulated this tentative generalization: ***Traffic accidents are due to a combination of closely interacting driver, vehicle, and roadway factors.***

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*Driver and Traffic Safety Education

For homework the teacher assigned three other cases for the students to analyze as a means of testing their tentative generalization. When the class met again, the students agreed that their formulated generalization appeared to apply to all accidents. The inquiry process continued when the teacher raised these follow-up questions:

> What does the generalization mean (implications) for driving behavior and traffic safety programming?
>
> Does the multiple cause concept apply to events outside highway traffic?

This example suggests the potential of the inquiry process for use in Driver and Traffic Safety Education.

Nothing is particularly difficult or mysterious about the use of an inquiry method in teaching. The process simply exploits the young persons natural tendency to inquire. This natural tendency may have been broken by making students follow the teacher's lead and come up with "right" answers (the most common form of teaching), but well-planned learning situations can revive their curiosity. Bruner describes an experiment that employed the game of Twenty Questions. Learners were told that a car ran off the road and hit a tree, and they were to ask questions that could be answered "yes" or "no" to discover the cause of the accident. Through this device (game) young people learned how to acquire and relate information, test hypotheses and solve problems. Other ideas for exploiting the potential of inquiry were described under the "method" section of various episodes.

In the preceding example, students asked the probing questions, but a more common inquiry technique finds the teacher raising questions that lead to an insight. The key to effectiveness in the inquiry process is to ask the right questions at the right time on the right issue. To develop young minds into thinking critically and rationally, teachers must control the natural tendency to provide answers. They should ask more questions than they answer. Here we are referring to questions that require synthesis, analysis or evaluation, as opposed to recall type questions.

Many of the generalizations in this study could be re-stated as questions. For example:

> The desire for status and security within a preferred group has a strong influence on risk acceptance.

Can easily be changed to this question:

> To what extent and what ways does our desire for status and security within a preferred group influence risk acceptance in driving?

In response to this question, and other probing questions, students can be led to a discovery of inner feelings that motivate their behavior. How ineffective it would be to handle this segment of learning by the telling process.

Are we in Driver and Traffic Safety Education utilizing this strategy of teaching to the degree warranted by its potential? For the most part our written and spoken words appear to be prescriptive in nature- "do this", don't do that". Can our curriculum be free of admonishing, dogmatic, "talking-down" statements, and instead replaced by "if then" statements so that the reason is implied? Furthermore, can we develop at least some ideas inductively so that students see the need and "feel" the basis for the desired behavior? *Ideas that students develop are more meaningful and remembered longer than the ideas handed down to them or imposed upon them.* True, this method is slower, but if the learning results are more significant additional time represents a small price to pay. Teaching a few basic concepts profoundly is better than "covering" a large body of content superfically. Our task is not to "cover" material, but rather to "unmask" or analyze ideas that increase the student's ability to direct his subsequent behavior intelligently.

When inquiry is used effectively in appropriate topical areas, knowledge of subject matter *unfolds* for the student and at the same time he is cultivating an attitude (inquiring mind) toward learning of far reaching value. For these reasons, the inquiry method furnishes the teacher with an effective strategy for accomplishing the objectives of driver and traffic safety education.

In the "new math," students learn how to derive their own mathematical rules, so they are equipped to handle the more complicated mathematical problems they will encounter in the future. No one can predict what kinds of mathematics will be required of people twenty years from now; similarly, who can say what kind of traffic conditions will confront drivers in the future. Therefore, in driver and traffic safety education, as in mathematics, we need to consider a teaching process that develops the student's ability to think independently and to adapt to a changing traffic world. The curriculum has to be organized not so much to teach subject matter, as to make fundamental the processes of conceptual thought that have permanent value. This suggests a "new" Driver and Traffic Safety Education.

Values And Teaching*

The Driver and Traffic Safety Education teacher faces the challenges of helping young people to develop a validated, usable system of values about traffic related matters. As previously suggested, a value results from activation of both the cognitive and affective domains, the linking of thought and knowledge with feelings and emotions. Teachers sometimes talk about changing attitudes and values as though the process occurred in a vacuum apart from any subject matter. Valuing goes along with content. The value must be toward something, and, to understand something so that a value can be placed on it, the person uses his intellectual abilities to evaluate information about the object, person or situation. In short, value issues act as coordinating concepts for most subject matter and provide a kind of substructure in the curriculum.

Values develop out of our experiences and serve to guide where we go and what we do with our lives. They are reflected in our aspirations, interests, feelings, beliefs and activities. Values are an integral part of our thought process involving more than simple right or wrong, good or bad, true or false. Living in general and driving in particular involves a weighing and balancing of conflicting demands, and finally an action that reflects a multitude of choices. Are we going to be a good "social citizen" and have another drink or be a good "traffic citizen" and refuse? In this situation two persons with the same amount of information about alcohol and driving may respond differently because of a value difference. Many critical choices of individuals as highway users and traffic citizens are choices of value (time, risk, status and others). There is strong support for the notion that values must be added to the list of possible explanations for people driving differently in similar circumstances.

Of course, a system of values is partially developed when the student enters Driver and Traffic Safety Education. He or she already possess some beliefs and attitudes about speed, drinking and driving, the use of radar and other topics related to traffic. Furthermore, many of the values which influence driving behavior are broad in scope and influence and are a part of the student's total value system (for example, values related to authority and social responsibility). Nevertheless, because of the interest students have in driving, and also because of the nature of the traffic environment, Driver and Traffic Safety Education has an unique opportunity to influence the value system of the student.

Traditional methods of teaching for values, particularly moralizing, are open to question. Too often we attempt to prescribe, exhort and coerce the student to accept our values instead of helping him to clarify his purposes, interests, beliefs and attitudes as a means to acquiring his own value system freely and thoughtfully. Moralizing encourages persons not to think for themselves, and to accept uncritically what the person with power or status happens to be telling them at the moment. Feelings, if any are engendered in this way, tend to lack the strength necessary to produce action when other complicating factors occur. So it would appear that in Driver and Traffic Safety Education, which depends so much on the cultivation of values, that teachers need to be particularly adept in establishing an atmosphere conducive to the value clarification process.

What kind of a teaching-learning climate will you find where the value process flourishes? First, you would probably be impressed by how uninhibited the students were in expressing their beliefs and attitudes in situations where there are no "right" answers. You might hear remarks such as "old drivers should be taken off the road;" "I don't see where a few drinks will hurt your driving;" or "I don't see why we have to wait until we're sixteen before we can drive;" and other value statements. Students would feel safe to speak their minds without fear of harsh judgments by their peers or teachers. Related to this freedom you would find a teacher responding to things a student says or does in a way that stimulates the student to clarify his thinking and behavior. Instead of the teacher saying, "You shouldn't feel that way;" "No, that's wrong;" "that's stupid;" and other judgmental remarks which fail to consider what the position means to the student, you are more likely to hear statements like the following:

> " Did you consider the alternatives?"
> "Can you give me some examples of that idea?"
> "What are the consequences of that idea?"
> "Is that a personal preference or do you think most people should feel that way?"
> "What are the assumptions behind your position?"

One can readily see that the second group of responses avoids moralizing, criticizing or trying to give values, but rather puts the responsibility on the student to examine his ideas and behavior and to decide for himself what he wants. Furthermore, they tend to communicate basic and honest respect for the student's thoughts and feelings.

The teacher in this kind of learning situation would use methods for eliciting value statements and then spend more time listening than talking. Students would be requested to write and/or discuss in class their reactions to quotations, provocative statements, contrived incidents, visuals, alternative positions, a series of probing questions and other devices which would tend to bring forth the attitudes and values of the students. When using these techniques a teacher constantly looks and listens for value indicators to respond to. In responding to the students, written or oral comments, the teacher should use the same non-judgmental

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*Many of the ideas in the discussion on values are drawn from *Values and Teaching* by Louis E. Raths and others. (81)

type of response previously described, in an effort to help students become more skillful in clarifying issues and in verifying facts on which they believe their value judgment rests. In this kind of climate the teacher gives up the somewhat standardized adult role of *telling* young people what to do, when, and where and how.

Verbalizing thoughts for communications to others helps students to clarify their beliefs, attitudes and values. A person in jest remarked, "I don't know what I think until I hear what I have to say." In the process of expressing attitudes and values for others to examine, one is compelled to organize his thinking in a meaningful form which may in itself afford him with a clear insight. He may then discover that his views are less valid than supposed and, as a result, he is more likely to consider alternative viewpoints. In addition, a therapeutic benefit results to the person who harbored a resentment about a certain issue. In a sense he will feel that he has "gotten even" with the persons or situations against whom he harbors the resentment, permitting him to view the matter with greater objectivity in the future. The value process takes advantage of these potential benefits by asking the student to speak or write about his views on various referents.

Although group discussion can help students to clarify their values, sometimes they should examine and write their views privately and deliberately on alternative positions, provocative statements, probing questions and other referents, before group discussion occurs. Valuing is a personal and private matter and cannot be accomplished effectively in a room full of talking, at least in the early stages of thinking on a particular issue. Some degree of argumentation may occur in group discussion causing participants to become defensive about positions which they were only trying to clarify and not necessarily adopt. But after students respond privately in writing, small group discussion will allow them to see and consider other alternatives which had not occured to them, but now they are less likely simply to copy another person's values. At some point in the process the teacher will react to their written work with clarifying responses, and perhaps read interesting alternatives in class. Then the process may be climaxed by a class discussion based as a solid structure of information and thought, the essential ingredients for forming generalizations.

In the value process there is time and place for the teacher to make known his ideas, feelings and values. We cannot deny that statements and behavior of certain teachers strongly influence student thought and action. The strength and direction of this influence depends on what they think of the teacher as a person. If they respect him and enjoy being in his classes, they will give serious consideration to his ideas. A respected teacher–or other model-identifying figure brought into the class in person or through tape, film or television–gives visibility to a value and furnishes additional evidence for the students to consider in analyzing the issue. In any case the teacher must make sure that he does not interfere with the value process when he injects his ideas and feelings. It takes a while for the proper atmosphere to develop, so the teacher should conceal his opinions during early trials of the process, or they will simply be copied. When the teacher senses that the students truly believe they can talk openly about matters and adopt their own position, then it is safe to present his views by statements and questions, such as, "This is how I see the issue," or "Have you considered this idea?" In this way, the teacher makes certain that students have considered all of the essential alternatives, without making any obvious effort to impose his values on the group or even indicate which are superior.

The right to choose values does not mean that the student has the right to choose how he will act in Driver and Traffic Safety Education class. A teacher is compelled to demand that the student obey traffic laws during laboratory driving periods, be honest in examinations and other assignments, consider the rights of others and other "ground rules" for classroom and laboratory behavior. However, the student decides for himself what value he places on these controls and the teacher, although he can influence, cannot force or control this process of valuing.

The value process represents *one* possible approach in the teacher's total repertory of methods, an approach to be used for helping students to clarify thinking on matters which have no "right" answers. When the objective is to teach or review subject matter, the teacher *will* make judgments about the adequacy of answers and he *will* provide standards of rightness or wrongness. How ridiculous it would be to raise clarifying responses about the validity of Newton's Laws of Motion or the physiological and psychological effects of alcohol. These topics embody solid scientific evidence to be learned by every student. However, the value each student places on the implications this subject matter has for his behavior will depend upon previous and subsequent learning. The main point here is that value clarification is not *the* method of teaching DTSE, not a panacea, but *one* promising method which can be integrated with other methods for affecting traffic behavior of young people.

Some teachers would be reluctant to allow students to adopt their own values, feeling that the students may choose "wrong" values. Keep in mind that students will adopt their own values whether the teacher uses the value clarification process or indoctrination techniques. In the area of values, learning is a personal and private matter which can be influenced but not forced by anyone. Force may win verbal acceptance and temporary compliance, but it will not produce the value necessary for changing behavior permanently. Underlining the value clarification process is the assumption that most young people who have acquired the facts on an issue will arrive at values best for them if given a free and open climate and a teacher skilled in managing the process. If they do not, what other approach acceptable in a country which prizes the democratic process would be any more effective? Perhaps those who prefer to indoctrinate students underestimate man's capacity for intelligent, self-directed behavior, particularly if we help him to clarify his values.

Evaluation and Grading

Properly conducted assessment of the capabilities that have been learned provides an important source of feedback to both learner and instructor. This feedback can be used to diagnose difficulties, plan activities and in general help the learner to enhance his learning experience. Unfortunately, assessment data is frequently used primarily for grading purposes, rather than as a device for improving student and teacher performance.

The traditional letter grading system tends to interfere with the kind of teacher-student interaction conducive to attitude and behavior change. Value judgments in the form of threatening grades act like static in broadcasting; they produce extraneous data which tend to distract the teacher and learner from the important objectives of the learning process. Many students become more concerned with figuring out what the teacher wants and values, than with any attempt at independent and original thinking. This situation almost negates the effective use of the clarification and inquiry methods suggested earlier. Fortunately, there seems to be a trend toward modifying the present system to reduce the negative effect of letter grading on meaningful learning. Stating learning objectives in specific behavioral terms is a significant step toward more effective evaluation. When this is done, and students are informed of the behaviors expected of them, they will no longer have to "psych out" the teacher's values. A set of well defined objectives for each learning episode, clearly evident to both instructor and learners, serve to motivate and guide the learning process of which evaluation is an integral part.

Behavioral objectives not only describe expected student behavior, but also demand a minimum level of performance. As teachers, we have the responsibility to see that each individual student can either meet this level of performance, or that we have evidence to show that it is impossible for him to do so. Unless we consider the material trivial, irrelevant and worthless, how can we justify dismissing a previous learning episode when some students understand only 50% or 75% of the material? (Especially, when safety is involved.) This suggests that we would have to evaluate a given student two, three, four or more times before the student finally mastered that knowledge or skill. But if we consider the task important, how dare we move on without making sure that the student can accomplish it? If the task is not important, why are we evaluating it?

There is a distinction between *norm-referenced* measures and measures that are *criterion-referenced,* and this discussion suggests that we emphasize the latter. Norm-referenced measures are interpreted only by reference to a distribution of scores obtained from an entire tested group. In other words, scores express the extent of individual differences, and students compete against each other for high scores. (This kind of competition is of questionable value with respect to learning.)' Furthermore, teachers tend to be pleased when the scores are widely distributed in a somewhat normal curve of distribution, because they are supposed to be discriminating in grading students. A criterion-referenced measure is quite different. Interest here is not how different one learner is from another, but rather on the extent to which each learner has achieved the performance objectives. Scores of this type of measure derive their meaning by reference to an external standard (criterion). It is the latter type of measure that is needed for assessing the performance objectives in DTSE.

When the criterion-referenced measures are used, teachers find out if the student can meet the minimum level of performance established for that particular concept, principle, topic or skill. If not, "back to the drawing board" for the student until he can meet the standard. In the case of written test items, the re-learning process may require only a brief explanation or reminder by the teacher to correct the deficiency. In other instances, additional study, practice or tutoring may be required before the student finally achieves the standard. In any case, failures are not simply ignored (perhaps even hoped for), as tends to occur when norm-referenced measures dominate the evaluation and grading process.

If all students are expected to achieve a minimum level of performance on objectives with which instructional planning began, what criteria can teachers use to be somewhat discriminating in assigning letter grades? No really satisfactory answer is available with respect to this question, but here are a few suggestions. Although each student must meet a minimum performance standard relative to the basic driving tasks and functions (ability to identify, predict, decide and act in a variety of traffic situations), some students will exceed that standard by a significant margin. This high level of achievement can be recorded and credited to the student through a higher grade. Other criteria, not directly related to driving task performance, available for grading purposes are:

1. promptness in turning in on time and in acceptable form, written or other assignments;
2. initiative in finding and using supplementary material;
3. respect for the ideas and values of fellow students;
4. conformance to the "ground rules" set up for the classroom and laboratory phases of the course;
5. ability to ask pertinent questions;
6. use of accurate thinking habits;
7. originality in carrying out special projects; and

8. effort, improvement and achievement in view of the learner's potential.

To evaluate objectively traits like promptness, initiative, respect, conformance and effort, the teacher needs to maintain a systematic procedure for keeping anecdotal records of student behavior.(38) This process will furnish the teacher with evidence to support his value judgments. Granted these traits are not essential for driving a motor vehicle, but they do facilitate class management and the learning process. In other words, they serve as a means for the student to acquire, more effectively, the concepts, skills and values that will help him to become a competent driver. So the motivating effect of grades can be an asset when used to encourage these traits.

Informing Students and Parents

The final grade, although required by administrative regulations and for other reasons, is absolutely meaningless to the parent unless some opportunity exists for describing the factors that were considered in arriving at the final evaluation. Therefore, this report *strongly recommends that additional information be supplied to the parents regarding their son's or daughter's readiness to drive.*

Two other steps are also recommended. First, both student and parent should be notified early in the course about the precise criteria that will be used for judging the student's proficiency and achievement at the end. Secondly, a few contacts (letters, telephone or face-to-face) with parents, and certainly with students, of the borderline or problem cases, may be warranted during the course to relieve a learning difficulty, or at least prepare the parent and the student for eventual failure. Students and parents deserve counsel before the final reckoning so that the student has a chance to rectify his ways. In any event, another letter should go to the parents at the end of the course describing the student's ability at that time.

Evaluation is not an *end* in itself, but a *means* to an end. The end is learning. Unfortunately, our present system of evaluation, with considerable emphasis on "grades", appears to be used as an end. Furthermore, norm-referenced measures breed student vs. student competition within a single class, an unhealthy intellectual and emotional climate. The trend toward stating curriculum objectives in specific behavioral terms capable of measurement, and requiring students to achieve a minimum standard, appears to be a promising development. Nevertheless, most teachers --performance objectives or not--still face the grading problem for which there appears to be no good solution. But that is no excuse for not doing a thorough job of evaluating student progress in meeting performance standards. Knowledge of progress is an effective motivator for the learner, and a valuable indicator for the instructor.

In conclusion, the following principles are suggested to guide the evaluation and grading process in Driver and Traffic Safety Education.

1. A sincere effort is made to evaluate and measure all the behavioral outcomes that driver and traffic safety education strives to develop.
2. Students and parents are clearly informed of grading criteria.
3. Students are periodically informed of their progress toward the course objectives.
4. Students are encouraged to evaluate their own physical, intellectual and psychological traits with respect to driving and citizenship.
5. Examinations and tests are constructed to emphasize the understanding of concepts and principles, not merely factual knowledge.
6. Teachers use student progress forms, rating scales and systematic recording of behavior to evaluate the social and emotional traits of students.
7. Students are encouraged to participate in driver education learning experience for the inherent driving and citizenship values rather than solely for the purpose of getting a grade.
8. Students and parents are given a detailed description of the student's status (strengths and weaknesses) at the completion of the course.
9. Teachers, within the limitations of time and resources, make an effort to follow the driving experience of students after they leave the course.

The Changing Role Of The Teacher

Recent developments in education suggest that the primary function of the teacher is to *manage* the learning process. This concept implies that the teacher is more of a situation provider than a mere conveyor of information. He must arrange situations to induce student reactions that will lead to learning. Moreover, the situations provided should be those that hold promise for making a difference in the behavior of students as they become active participants in the highway transportation system. It appears doubtful that a mere "pouring in" process will be effective in this regard.

Teaching Strategies

Driver and Traffic Safety Education teachers need a variety of strategies (patterns of behavior, maneuvers, methods) at their disposal to handle different kinds of learning and a variety of students. Teaching strategies are more or less useful depending upon the educational objective at the moment

For example:*

If we are trying to induce	*then we use*
1. mastery of content and achievement of skills related to the driving task.	1. demonstrations, recitation, programmed techniques and strategies that maximize memory and skill development;

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*The ideas here are from *The Structure of Teaching* by Bruce R. Joyce and Berj Harootunian, pages 110-111. (56)

2. productive thinking, including the ability to interpret and evaluate information from generalizations; application of facts and principles in new situations; formulating and testing of hypotheses.	2. questioning, interpretation of data excercises, problem solving techniques, case study analysis, games which induce students to think and other inquiry type strategies;
3. self-direction and improvement.	3. provocative statements, questions and stituations to elicit attitudinal statements, written and oral teacher responses (non-judgmental) to attitudinal statements, discussions, role playing, individual counseling, and other tactics which induce students to reflect on themselves and take responsibility for their own behavior.

These examples, not intended to be all inclusive, summarize three important types of student behavior that lead to learning, and suggest appropriate strategies for stimulating the behavior.

Very few teachers can become highly competent in a large number of strategies, but most teachers can and should expand their range of maneuvers. As their range increases, the opportunities for bringing about more kinds of learning also increases. Each teacher must create the kinds of tactics that he is comfortable with and can implement in accord with his personality, but this does not preclude an extension of his teaching styles. Teachers who gain great satisfaction from the customary role of giving information and demonstrating skills, can experience even greater satisfaction from guiding students through an inquiry or clarification process. However, added skill and satisfaction in the use of a new method may take some time. In most cases, the new tactic should be tried in small segments, so that skill and confidence are built gradually. Otherwise frustration and failure may result, causing the teacher to decide that the tactic is worthless, when in fact, the manner of *use* of the tactic was the real reason for failure. In any case, teachers can extend their teaching repertoire dramatically if they are acquainted with the essential conditions for using the proposed method, and willing to try out new ideas.

The Teacher and Technology

In Driver and Traffic Safety Education, as well as in other subjects, the development of simulation, educational television, programmed learning, and multi-media are causing a change in the teacher's role. These devices for presenting vicarious experiences and for automatizing some learning will not replace the teacher, but instead they may create a demand for more and better teachers. If the more onerous aspects of teaching can be relegated to automatizing devices which convey information and increase the opportunities for self-instruction, then the teacher can concentrate his skills on helping students to form generalizations, to clarify values, and to develop decision-making capabilities. These higher and more difficult forms of learning, too often neglected, depend upon the acquisition of prerequisite knowledge which can be supplied by these newer media. The task of selecting appropriate "packaged" material, and planning situations which cause the student to interact actively with the material, will become an increasingly important challenge to the teacher. Reconstructing the role of the teacher does not require new and highly sophisticated facilities, equipment and materials. The emphasis is not on what the teacher could do with better equipment and facilities, but what is possible by way of improving the climate of learning. Every teacher is in a position to introduce and encourage a commitment to thinking, to reasoned beliefs, to the pursuit of ideas. The process of finding and testing meaning only requires a teacher knowledgeable of the subject matter and the learning process, with a lively imagination and interest in playing with ideas. A teacher with these competencies will do better with modern learning devices, but the devices will not compensate for the inadequate teacher.

Developing Decision-Making Capability

Since the decision-making process is so prominant in driving and other tasks related to the system, instruction in Driver and Traffic Safety Education must facilitate and regulate the exploration of alternatives on the part of the learner. A multitude of alternatives are involved in driving and preparing to drive. "Should I make the trip in this weather?" "Should I pass that other car?". "Will another drink make a difference?". Aside from driving, we decide on alternatives related to support for traffic officials, traffic safety legislation, car and insurance purchases, use of the family car, and many others. If the teacher is successful, students will learn to assess alternative arguments in a consistent and intelligent way, by examining the consequences of the choices for both the individual and society. The assumption underlying this method is that self-direction and self-discipline are not acquired merely by carrying out the dictates of others, but are cultivated by giving students the opportunity for facing problems, exploring alternatives, making and implementing decisions. Instruction is only a provisional state, designed to make the learner more self-sufficient for meeting interpersonal and institutional type problems typical of what they will confront in the future.

Certain actions on the part of the teacher will facilitate the process of exploring alternatives. Alternatives, first of all, should have meaning for the student and should be goal oriented. In this regard the teacher at times may let the student present the alternatives. This technique can help establish a climate in which students feel free to reveal perceptions and to explore ideas, beliefs and values in a search for meaning. The student must feel free to choose, because a coerced choice is no choice at all. However, the student must be reminded that in some areas there is no choice available that an intelligent person would consider. In summary, the teacher helps to identify meaningful alternatives, acts as a counter to the ideas put forth demanding only that they be supported, and ultimately leads the students through a process of thought which clearly reveals the personal and societal consequences of the choices.

Team Teaching

In recent years, the practice of two or more teachers pooling their efforts and taking responsibility together for teaching groups of students has become increasingly prevalent. The nature of driver and traffic safety education, with both classroom laboratory experience, lends itself quite well to team teaching. In fact, many situations demand that two or more teachers coordinate their efforts. For example, in some schools different teachers handle the classroom and laboratory instruction. A common example of team teaching in Driver and Traffic Safety Education is found in the use of the multiple-car method. The team plan takes a variety of other forms, but in any case, a basic requirement for success in this venture is the opportunity for members of the team to meet and plan together.

Team teaching has a number of features that facilitate the teaching-learning process. (56)

1. Two or more teachers can manage and control a large number of students better than a single teacher (reinforce each other emotionally and intellectually).
2. Teachers are in a better position to provide personal assistance to a student having difficulty.
3. A team of teachers cooperating with one another sets a good example of a model adult society that students could imitate.
4. Teachers are able to analyze one another's performance and provide feedback to each other that will help to improve the learning process.
5. Occasionally one teacher is able to reach a child that other team members seemed unable to help.
6. Teaching teams generate better ideas for lessons as members become sources of ideas for one another.
7. A team approach furnishes the opportunity to exploit the special capabilities of individual members. (Teachers complement each other.)

For many years the teacher's primary responsibility was his own class, which he taught alone. The capabilities needed for success in that setting are appropriate in team teaching, but, in addition, some special attributes are required. Team teaching demands that every member learn to work and plan together in a responsible manner.

School Superintendents Look At Driver Educators

The following excerpts from speeches of two school superintendents are used to conclude this section on the changing role of the teacher.

Dr. Robert P. Moser presently with the Wisconsin Improvement Program at the University of Wisconsin included these remarks in a speech entitled, "What A Superintendent Expects From Driver Education Instruction".

> First of all, if we envision driver training to involve only the physical skills of handling a lethal weapon, the automobile, we ought to forget the whole thing as far as schools are concerned, and let some other agency of society employ a bunch of technicians or para-professionals to handle the habit teaching, and let it go at that.
>
> On the other hand, if we envision driver education as a significant means of human conservation, as an important phase of student attitudinal development—then, and only then we have every right to be engaged in the activity—as a matter of fact, society will require that we be engaged in it and that we do an expert job with it. If we are really going to educate drivers as opposed to just training them, we must have some pretty high level expectations for the men whom we call our driver educators. So far as I am concerned you are not driver trainers; you are driver educators—and there is a significant difference.
>
> I don't want to be misunderstood, and I don't mean that all we have to do is just shrink heads and develop attitudes and everything will come out fine. We must realize that part of the process in education of drivers does involve skills development, but that the skills are means and not ends, and we ought to remember that the skills come first along with the attitudinal development. By no means is the end passing the driver's test, and passing the test ought not to be held out as the objective—the objective is safe and sane behavior on the highway. (68)

Dr. Dwight Teel, Assistant Superintendent of Curriculum and Instruction, Milwaukee Public Schools, spoke on "Ethics of Driver Education Instructors."

> The driver education teacher needs to demonstrate the hallmarks of a teacher, not only with respect to driving skills and knowledge, but the hallmarks for the teaching profession of which he is a member and which encompasses driver education. As teachers, we have the responsibility of using the tools of the teacher. I am speaking to the importance of such things as the driver education teacher using good English and of having written materials prepared neatly, in standard format, and well-organized so that they communicate effectively—the same standards that apply for other subject areas.
>
> We are teaching our students more than how to drive. We are educating youth to be the kind of people

> we want them to become. We teach them to drive only because we want them to become kinds of people who behave in certain ways in our society. If we take our charge as really being teachers of young people, using driver education as the medium through which we teach and look at what we want these persons to become and then develop our whole relationship with them in this regard, we should have a better product of person, scholar and citizen. (103)

Evaluating Specific Methods And Techniques

Some years ago the project director spent a semester observing high school DTSE teachers in the classroom. Here are four generalizations based on those observations.

1. Teachers were highly enthusiastic about their subject and eager to acquire new ideas that would improve their instruction. However, many were concerned because the students failed to share their enthusiasm for the classroom instruction.
2. The majority were doing conventional teaching from the textbook (read-recite-test), rarely using a panel, a demonstration, role playing or a discussion of some local or personal problem. When teachers did relate textbook material to local and personal problems increased interest was apparent and the class was "alive".
3. Much class time was spent learning traffic laws and other facts that students can acquire outside the class. Perhaps this practice helps to explain why some teachers complained about not having enough time.
4. Compliance and unquestioning acceptance of the teacher and textbook authority was promoted by typical classroom procedures. A teacher seldom responded to a student's question with "What do you think?" but instead presented a neat little answer that usually closed the issue.

Students enjoy and profit from methods that stress intelligent classroom participation. They are no longer content to sit and be taught; not content with a passive role.

We should think of the student as an active learner and not as a passive receptacle into which we stuff required bits of knowledge. In fact, if intellectual activities remain passive exercises, while the excitement of doing, exploring, creating and decision-making is left to the athletic field, yearbook office and dance committee, then interest in classroom activities will surely decline. In DTSE the important concern is that students not only know, but also that they believe and act on the acquired knowledge. This objective will more likely be realized if they have as many real and contrived purposeful experiences as the teacher can reasonably arrange. Learning is experiencing, doing and reacting.

Teaching methods vary according to the personality and previous experience of the teacher, facilities and equipment available, student needs and maturity level, purpose and other factors. A successful approach in one situation will not necessarily work in another, and no one method is best for all situations. In fact, there is a surprising variation in the methods used even among the most successful teachers. However, when an approach is effective you find that: (1) the method was skillfully handled; (2) the teacher possessed confidence in the method; (3) the method was appropriate to the end desired and the group taught. The following discussion evaluates the potential of selected methods and techniques for achieving specific learning goals.

Dramatizations—Role Playing

The role playing idea suggests promise for cultivating attitudes as well as for knowledge acquisition. Two or more students act out a situation relating to a problem which the group is discussing. For the most part, conversation is spontaneous, which tends to bring out feelings and attitudes which otherwise might not appear. If one of the students has previously displayed hostility toward policemen, the teacher could arrange for him to play a policeman's role, the theory being that the student's hostility would be reduced after viewing the policeman's role from a different view. Under proper guidance, which insists that the group attend to the subject under discussion, rather than the role-playing itself, this technique can effectively dramatize different viewpoints in a way that promotes better individual and group understanding of interpersonal problems. Here are suggestions for role playing situations:

1. A man and woman driver at an accident scene talking to a traffic accident investigator (or other situations at an accident scene).
2. Policeman stopping a violator, with the ensuing conversation.
3. Mock traffic court trial.
4. Teenager and parent discussing the use of the family car.
5. Passenger and driver engaged in conversation to show how the passanger can be a help or hindrance to the driver.
6. A meeting of the community traffic safety council.
7. Insurance agent and driver discussing an automobile insurance plan.

Field Trips

Cost and time problems prohibit frequent field trips for an entire class, therefore, teachers more commonly assign trips to individuals and small groups. Whether the whole class or a small group takes the trip, the teacher should help them prepare for the type of experience they can expect to encounter. A mimeographed guide, which includes questions and problems developed jointly by teacher and students, helps insure a rich educational experience. Pooling experiences and discussing ways to improve future trips culuminates the activity. Suggested field trips relating to DTSE objectives:

1. Traffic Bureau of Police Department
2. Traffic Court

3. Insurance office
4. Accident scene
5. Traffic violators school
6. Legislative session
7. Traffic engineer's office

Games

As a change of pace, games can be devised in which the students face traffic related decisions they will face in later life. For example, the format from one of the currently popular television quiz shows could be adapted to classroom use. Students will quite likely derive the greatest benefit from the thinking and study necessary to formulate good questions. The interest and motivation stimulated by the competition involved in this technique may be used to good advantage by the imaginative teacher.

Group Discussions

Our attention here is on a process in which students actively take part in examing a problem in an organized way. The primary purpose is *not* to acquire new information, but rather to form generalizations and cultivate new insights and values. The teacher makes certain that students have acquired at least a certain minimum of prerequisite knowledge, defines the area of discussion, and poses relevant questions. (Questions are not designed to elicit "facts", but instead to help students generate hypotheses and clarify values.) Otherwise, the teacher (or a student) plays the role of moderator, relating student comments to one another and to the central problem, so that an orderly sequence of discussion is maintained. The teacher refers student questions to the group for their consideration rather than rushing in which ready-made answers. Through this and other techniques, the teacher maximizes student participation and avoids making any obvious effort to impose his generalizations and values on the group. Ideally, the group forms the generalizations and arrives at a new position by analyzing the consequences of alternative experiences and conflicting positions. The group under the direction of the teacher tries to reach a consensus, but if this is not possible, at least the differences are clarified. In summary, it can be said that group discussion furnishes teachers with a valuable tool in helping students form generalizations and clarify values that will lead to intelligent courses of action.

Independent Study

Proper teacher planning for independent study assignments can help to solve at least two challenges confronting driver and traffic safety education (other subjects also).

1. Students enter DTSE with varying background, experiences and capabilities, related to driving and traffic safety. Therefore, each student needs a different kind of DTSE.
2. Most teachers find that the time allotted to DTSE within the total curriculum is insufficient for accomplishing the objectives of the course.

The following discussion will not treat these problems separately, but will present some ideas in support of independent study as a means of meeting one or both of the challenges. There is nothing new about independent study; the teachers have been assigning "homework" since the beginning of formal education. Undoubtedly, this mode of instruction can perform a highly important role when used properly. Homework assignments should be integrated with preceding and subsequent learning experiences, and also be within the capability of every student. Their purpose is not to separate the bright and dull students, but rather to ensure that all students have *acquired a set of prerequisite knowledge.* When the homework assignment has been effective, teachers can then proceed to provide learning experiences in class that students cannot duplicate on their own.

What is the potential of independent study for achieving the objectives of DTSE? Teachers commonly spend a large amount of scheduled class time on traffic laws and other factual material. Is it not possible to pre-package this kind of information so that students acquire the knowledge via self-instruction outside of class? Through a brief recitation* or written quiz, the teacher then checks to make certain that students have indeed learned the material. Given well designed written material and diagrams, students can also learn the steps for various driving maneuvers as homework assignments. Many other examples could be presented to illustrate the value of self-instruction in conserving scheduled class and laboratory time for group discusssions, demonstrations, panel presentations, resource people, role playing, films and filmstrips, supervised driving practice and other learning activities that cannot be duplicated elsewhere.

Higher forms of learning should also be built into homework assignments. Learning referents such as questions, provocative statements, magazine or newspaper articles, accident cases and traffic situations are particularly valuable in this regard. Depending on the nature of the referent, students are asked either to interpret, evaluate, summarize, look for underlying causes (accident cases), or hypothesize. In addition, homework assignments sometimes take the form of individual or group projects. Here students get practice in designing projects or investigations that lead to a product, like a report or a demonstration. Examples of this type of assignment are found in Section III, Unit B. The intention here is merely to emphasize that outside assignments lend themselves to both the clarification and inquiry processes previously described.

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*Recitation is a legitimate mode of instruction when confined to assessment and feedback of what the student has learned outside the class.

Outside assignments which promote self-instruction: (1) furnish opportunities to tailor the course to meet individual needs and interests; (2) allow class time to be used for activities best suited to "group" learning; and (3) enrich and expand learning opportunities. Driver and Traffic Safety Education involves a broad body of cognitive, affective and psychomotor learnings to be acquired and developed within a relatively short time. This reality demands a high level of efficiency in the use of time which will be facilitated by self-instruction well integrated with other modes of teaching.

Informing, Explaining and "Showing How"

Although use of the lecture method in high school is in somewhat bad repute, the very nature of the teaching process makes "telling" and "explaining" take up a fairly large portion of the total classroom time (a smaller portion in the laboratory phase). For explaining a process, introducing a new topic, showing how something is done, or summarizing what has been learned, it is reasonable to expect the teacher to do considerable talking. When the objective is limited to acquisition of knowledge possessed by the teacher or other expert, a presentation can provide facts and information to many people at the same time. However, the competent teacher explains only enough "to explain" and does not compel the learners to absorb a lot of information which may be irrelevant to the achievment of the immediate task or question. He feels his way by observing facial expressions, observing trials and listening to questions. In this manner he determines the appropriate time for clarification or repetition. Frequently, the results are better if we err on the side of offering less rather than overdoing the explanation. You may have heard of the student who described his teacher by saying, "He tells us more than we want to know". The real genius lies in just offering enough to meet the situation.

Appropriate visual aids, used properly, increase the teacher's power to inform and explain. A picture is not necessarily worth 1,000 words, but it can be. Teachers should make certain that the material presented is clear and well-illustrated, appealing to as many of the receptor senses as possible. Use of the blackboard, various kinds of projectors, charts, models, demonstrations and other aids enrich explanations and facilitate learning. Not all students learn in the same way, but all of them need to see the process clearly and understand the accompanying words.

Motion Pictures

In determining whether a motion picture, or another teaching method should be used, the teacher looks at the objectives for a particular segment, and then determines the nature of the learning situation that best promotes these objectives. A film is appropriate if it promises to contribute certain experiences to the learning situation that cannot be achieved in any other reasonable way. However, the film is not a teacher substitute–functioning in isolation – but rather a supplementary teaching device that needs correlation with the topic being studied and with other aids to produce an integrated learning experience. Since students are conditioned to the motion picture as an entertainment medium, they need training in how to look upon a film as a vital source of information. In short, they must learn to learn through films. Although there is no fixed rule for teacher and student preparation to use a film, the following practices are in common usage among skilled teachers.

1. Preview the film and prepare a brief outline or guide to the film content. Guides are generally available from the producer.
2. Explain to the class what the film can contribute to the topic being studied.
3. Discuss new words or terms used in the film.
4. Present a brief list of questions to direct the attention of learners to key points that will be discussed.
5. Set up the best possible conditions of temperature, illumination, sound and seating.
6. Telling the students they will be examined on the film will step up learning considerably.

Well-conceived teacher and student preparation for a motion picture pays off in the post-showing discussion period. At this time misconceptions are cleared up and follow-up activites initiated. A suitable film, intelligently presented, sometimes stimulates increased interest in a topic leading to further study and reports by individuals or committees, field trips, invitations to resource people, and other activities. Other teaching materials may be made available such as models, charts, pictures and reference books to follow up important points in the film. Occasionally, a second showing is profitable. Whatever follow-up activity students engage in, the aim is to develop concepts, desirable attitudes and improved ability to think. These factors are major goals of a classroom instruction, and the motion picture provides a dynamic teaching device to aid the teacher in achieving these outcomes.*

Panels

If the primary purpose is to present information–often controversial–from several points of view, the panel technique is appropriate. Several students report facts and information concerning a selected topic, and then discuss the issue, guided by a moderator. Following this, the moderator entertains questions and commentary from other class members. The active panel members usually benefit most by the experience, but the thinking of other students can also be stimulated and clarified by the formal presentation and the ensuing discussion.

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*The use of television will not be discussed separately since most of the guidelines presented here also apply to television.

Projects

Under proper direction a project type assignment can be a stimulating and meaningful experience for the students, especially if the teacher successfully challenges their ingenuity and originality. To help students select a subject teachers sometimes suggest a list of projects from which they may choose, but at the same time encourages original ideas. In any case, projects selected should be those that promise a significant learning experience for the students involved.

As with any teaching technique certain limitations exist, but the effective teacher works at overcoming them. Not infrequently the project, whether it be a model, chart or survey, becomes an end in itself; thus, the student learns only to build a model, construct a chart, or conduct a survey. To avoid this situation the wise teacher encourages students to focus attention on the implications which the project and its underlying data have for improving driver behavior or some other aspect of the system.

Students need to understand and appreciate the purpose of their activities. Motivation increases when they know something worthwhile will result from their efforts. Culminating activities take many forms, but certainly each student or group should at least report their project outcome to the class. Following these reports the outstanding ones could then be exhibited to other school and community groups.

Information on driving habits and other data may interest and aid official traffic agencies and public information media. However, teachers should clear with official agencies before releasing any information that might reflect on the efficiency of the police, traffic engineer, driver license officials or safety council director. More than one teacher has learned this the hard way, in spite of good intentions. If the traffic agencies are consulted during the project planning stage, conflicts are avoided, ideas for the projects are obtained, students are impressed with the need for coordinated traffic safety efforts, and the school and community are brought closer together.

In a mid-western city, the Police Department asked the high school driver education class to tabulate the numbers and types of violations, especially right and left turns, at an intersection having numerous minor accidents. The survey was conducted during the hours when the accidents were most frequent. Students worked in pairs, each armed with a tabulation sheet. When the data was finally gathered and summarized, the survey showed that the accidents were not a result of persons making improper right and left turns, but rather a result of congestion due to double parking. After stepping up enforcement of the parking law, accidents in this area were reduced fifty percent. The driver education class was awarded a citation from the Police Department for the significant contribution to solving the problem.

In another community, a committee of students from a driver education class developed a scale map of their town, and then plotted the accidents for a one-year period using different colored pins to indicate fatal, injury and property damage accidents. This project was especially significant because the police had no spot map, and, therefore, used the one developed by the students.

The above examples represent the type of projects for driver education students that are not "busy work", but are practical experiences in effective traffic citizenship.

Psychophysical Tests

In most driver and traffic safety education courses, teachers use devices to test psychophysical factors that affect the safety and quality of driving. The teacher must realize that in general the test scores do not give complete, professional measurement of the physical characteristics tested. Moreover, the teacher does not have the competence or authority to diagnose physical defects. Nevertheless, the tests can furnish preliminary indications that more detailed, exact and professional measurements should be made, as, for example, in cases of possible eye defects. The school has a legal and moral responsibility to make a reasonable effort to determine a student's physical fitness before placing him behind the wheel of a car in traffic. In many schools the nurse already has health information on students that will be valuable to the driver education teacher. However, even though she may have all the data needed to determine the fitness of individuals for driver education, the teacher will probable still want to use the tests for other reasons.

In addition to their screening function, psychophysical testing devices can also serve an educational function. The tests are especially effective in stimulating interest which can be used to emphasize how one can learn to compensate in his driving for limitations. Studies show that certain physically handicapped groups have better driving records than the "average driver" simply because they are aware of their deficiences and have learned how to compensate. These tests serve to show beginners that the other highway users they will meet on the road vary in physical ability. Full appreciation of this fact encourages drivers to be prepared for unsafe behavior by others due to physical impairments.

A class session or two preceding the administration of the tests permits a study and demonstration of the physical factors affecting the driver, the normal range of ability in these traits, how they are tested and ways to compensate for limitations. These sessions should come near the beginning of the course, particularly if the students are starting laboratory driving lessons. If the driver education teacher is solely responsible for determining physical fitness through these tests, they should be administered before the student goes on the road.

Investigations comparing accident-free and accident-repeater drivers reveal no significant difference between the two groups in physical abilities. In spite of this, normal physical traits are an obvious asset to drivers and psychophysical tests are still useful in driver education, but the teacher should explain their limitations to prevent students from associating good scores on the tests with superior ability to drive safely. This thinking could lead to complacency and overconfidence.

Psychophysical tests can be purchased, loaned, constructed, or improvised. Naturally, the most convenient plan is for the school to own a set of the tests, so they are available whenever needed, but this is not always economically feasible. In some localities schools have joined together to purchase a set cooperatively. In other instances, the teacher or students have built their own, through the cooperation of the Industrial Arts Department. Teachers have also devised ingenuous ways of simulating the testing devices with little loss of educational value. Whichever plan is adopted depends on the budget, location of the school, availability of tests on a loan basis and the inclination of the teacher.

Resource Persons

Since the content of DTSE includes information from many disciplines, the teacher of this subject cannot be an expert on every area. So he frequently invites the police officer, traffic engineer, insurance representative and others to visit his classes. However, the responsibility remains with the teacher to insure a profitable experience for his class. Careful planning, which considers the following suggestions, tends to increase the effectiveness of these visits.

1. Know the speaking capabilities and philosophy of the specialist before issuing an invitation. You can turn off a poor film, but not a guest speaker.
2. Schedule well in advance so everyone concerned has sufficient time to prepare.
3. Carefully delineate the items you desire included in the presentation. Most speakers will appreicate this information.
4. Prepare the students for the visitor. Outline what they can expect to learn, and also prepare questions for him to answer.
5. Follow up the visit by reviewing, summarizing and evaluating the session. The visit may stimulate interest in a related topic or activity.
6. Promote correlated learning by having students introduce the speaker and write the thank you note.
7. Realize the public relations value of this technique by notifying the public information media.

Supplementary Reading Assignments

This technique is suggested on the basis of two assumptions: (1) students can profit by selecting and reading magazine articles, booklets and pamphlets on traffic safety; (2) requiring them to write a brief annotation and evaluation of the reading increases the value of the learning experience. In order to prevent the length of the article from being the main determining factor in the selection of articles, a system of "weights" can be established. Using a three to five page article as a basic weight of one, and counting articles twice and three times that long a weight of two and three respectively, students tend to use other criteria for selection. The length of an annotation for a basic one-weight article can be set at say 100 words. If a longer article, booklet or pamphlet is read and is to be credited as an equivalent of several articles, 100 words is used as the basic one-weight and multiplied times the number of 100-word units. For example, one booklet the equivalent of five (5) small articles should receive a weight of 5.

The annotation should indicate the nature and scope of the article's content, and in a separate paragraph the student writes a few sentences appraising the reading. The title information preceding the annotation follows a standard form.

Sample Annotation

Bauer, John, "The Teenage Rebel and His Weapon - The Automobile", *Traffic Safety*, 5 (July, 1969) pp. 10-15, 32.wgt.1.

> The automobile is described as a tool by which the young driver is allowed to express himself. To make matters worse the teenager is undergoing a period of difficult mental and emotional adjustment. He or she is too big to be treated as a child and too young to take an adult's place in the world. When the pressure of this situation gets too large, something has to give, and too often the teenagers rebel personality asserts itself in poor driving habits. Mr. Bauer calls for more effective studies of the teenagers to weed out the potentially unsafe driver and more effective legislation pertaining to unsafe drivers who cannot be rehabilitated.
>
> The author has clearly explained the basic cause of reckless driving habits by some teenagers. However, most young people are learning to be responsible drivers.

Traffic Accident Analysis

One of the most important objectives in Driver and Traffic Safety Education is to develop the ability to sense a hazardous situation. Possibilities for increasing this ability exist in having students analyze case studies of traffic accidents. Cases should involve drivers whose ages match those of the students, so they can identify with the characters in the accident. Here is an example of an accident described by 17-year old Bruce Coble, that could be used for analysis.

> "After school on Friday, Lance, a friend of mine, came home to help me with the chores and stayed to eat

dinner with us. Mother wasn't too happy about this because she thinks Lance has some bad habits, especially in driving, that I will follow. After dinner, we went to the high school football game in my car.

"Following the game, two carloads of us decided to drive to a school dance in another town to meet some girls. The other car started out ahead of us, but I passed them and was still well ahead, driving about 55-60 mph, when the trouble started. It was a rainy night and the road surface was wet.

"The accident happened real fast. My left front wheel caught in the center mound of wet gravel pushed there that day by the grader and my car pulled sharply to the left. I tried to correct the situation by steering and braking, but we skidded across the highway and off the road, where we hit a boulder that toppled the car over on its top.

"One of my passengers suffered a badly bruised ankle and shoulder. The car was a total loss. The result could have been much worse because we barely missed a tree when we left the roadway."

Imagine a teacher skillfully prompting his students to think, study and discuss the following questions about the case you just read:

> What factors contributed to the accident?
> Why did Bruce act the way he did?
> Have you observed behavior like his in an acquaintance of yours?
> If you get into a similar situation as a driver or passenger, what can you do to avoid trouble?

Certainly, a classroom discussion of questions like these would tend to widen and enrich the students' store of information about the what, why and how of traffic accidents. Through the discussion, concepts might be developed that would relate to such things as: the effect of emotions on driver behavior; the danger of a competitive urge when driving; passenger responsibility in preventing automobile accidents; misperception of road conditions; how to cope with a skidding car; the coefficient of friction on wet gravel; and responsibility of road departments in preventing traffic accidents. All of these are topics usually taught in driver education courses, but here they would be related meaningfully around a single focal point – the accident.

The following guidelines are suggested to the teacher who desires to explore the possibilities of this type of learning experience.

1. *Sources of Accident Cases*

   a. Police accident reports or interviews with traffic investigators.
   b. Teacher-prepared cases based on interviews with drivers involved in accidents.
   c. Student-prepared cases based on interviews with drivers involved in accidents.
   d. Direct accident experiences in which the students were involved as passengers.

2. *When to Use*

   a. To stimulate interest in a new topic, or to illustrate an important concept under the topic.
   b. Near the end of the course to help students relate, review and reinforce the content of the course.

3. *How to Present the Cases*

   a. The essential driver, vehicle and environmental factors should be in printed, tape or record form.
   b. The diagram of the accident can be printed along with the other information; otherwise chalk, magnetic or flannel board, opaque or overhead projector, or slides can project the diagram.

4. *Different Approaches to Case Analysis*

   a. Present the case to the entire class and ask them to identify the factors causing the accident along with preventative measures.
   b. Divide the class into groups of 3-6 members and give each group a different case. After they have time to study the factors involved, permit the groups to report their findings to the class.
   c. Assign students to play the role of the driver or drivers involved in the case. After they present their story, allow the class to ask questions of the drivers.
   d. After the students know how to proceed in analyzing the cases, assign cases to be completed independently as an outside written assignment.

Students and teachers involved in field testing the accident analysis technique, emphasized that these general benefits can result. (13)

1. Studying actual accident cases focuses student attention on the "crucial learnings" needed by drivers to operate safely and efficiently on the highway.
2. An accident case may involve important concepts from all the traditional units of driver education instruction. Integrating and relating the concepts around a focal point, the accident, tends to establish a meaningful learning experience.
3. Students learn that most accidents involve more than a single cause, and that none of the factors are trivial if they were needed to create the accident.

4. Teachers discovered that accident cases "triggered" a lively group discussion, which helped students to clarify their beliefs, attitudes and understandings of concepts involved in the accident.
5. Students felt that the accident analysis experience helped them develop the ability and desire to recognize accident-producing situations and adjust accordingly.
6. Based on student reactions, one of the greatest values in using accident case studies for analysis appears to be in preparing drivers to react correctly in emergency driving situations.

Like any other technique, effectiveness of the case study technique depends largely on how the process is handled. Teachers should try different ways of using the technique in an effort to squeeze out every bit of learning, which may be a surprisingly large amount. Further experimentation, with built-in evaluation, is needed to evaluate this and other devices for achieving the objective of DTSE.

Traffic Situation Analysis

Analyzing pictures (still or moving) or drawings of traffic situations will help students develop perceptual, predictive and decision-making capabilities. These can be presented through slides, filmstrips, short films or graphic illustrations developed by the teacher or students, or obtained from an outside source. The class as a group, or students working independently, view the situation in a problem solving attitude, looking for cues that require the driver to adjust his speed or position.

Traffic situation analysis tends to stimulate interest, discussion and further study. In addition to improving the ability to identify, predict and select appropriate courses of action, many opportunities arise for teaching traffic laws and other segments of content in a meaningful setting. The ingenious teacher capitalizes on the initial interest created by the situation, using it as a means to developing or discovering important generalizations.

Laboratory Methods

Methods under this category are well described in college textbooks in DTSE and in other publications. The reader's attention is directed to the following publications related to the three major laboratory methods.

Anderson, William G., *In-Car Instruction: Methods and Content,* Addison-Wesley Publishing Company, Menlo Park, California, 1968.

Automotive Safety Foundation, Washington D.C.
The Multiple Car Method, 1967
The Driving Simulator Method, 1970

Conclusion

Attempts to evaluate the relative merits of teaching methods is complicated by two major factors. First, no one has yet formulated a learning theory satisfactory in all respects. Theorists differ in basic viewpoint and accepted premises. Secondly, the complexity of the teaching-learning process has handicapped attempts to measure the relative merits of various methods, so evidence to support "best" methods is somewhat inconclusive.

In the following paragraph, Bruner suggests that we are still in a very early stage of development with respect to pedagogy, and thus need to experiment, evaluate and refine. Someday we will be ready to compare the effectiveness of one method against another, he adds:

> "In conclusion, let me take a very pragmatic position. Develop the best pedagogy you can. See how well you can do. Then analyze the nature of what you did that worked. We do not yet have enough good principles at this point to design an adequate experiment in which this group gets this 'treatment' and that group another 'treatment.' The experiments of this type have been grossly disappointing. The best things that you can do at any given point, I would urge, is to design a pedagogical 'treatment' that works extremely well, and then work your way back. Later on, design hypotheses to determine what you did. But for the moment, can we not declare a moratorium on little experiments that produce miniscule effects? Instead, use contrast, use different kinds of representations, use such formalisms as you can, develop self-consciousness. With a mixture of psychology, common sense and luck you may produce an effect on learning that is worth studying. Then purify and experiment. But first invent and observe. That seems to me to be the pragmatic strategy. It is not in the grand experimental tradition of physics. But is experimental pedagogy in the grand tradition of physics at this point in history? It may very well be that it is more like economics, a mixture of models and pragmatics. It is in this spirit that I have suggested six ways of possibly aiding a child to discover something for himself. The formal experiments can wait until we have shown that some 'treatment' is worth the trouble." (71)

In spite of Bruner's statement, many facts about learning theory are known and accepted, but wide differences appear between theroists and practices by the average teacher. That condition does not mean that the theorists are wrong; it may mean that teachers have not acquired the essential skills for implementing the theory. This section is designed to help curriculum builders and teachers bridge the gap between theory and practice.

SUMMARY AND CONCLUSIONS

Following are the major ideas which either guided or resulted from this curriculm study.

Nature of Driver and Traffic Safety Education

Formal instruction is essential to help young people enter the highway transportation system as vehicle operators and as responsible participants in system improvements. Instruction should not be confined to developing entry level psychomotor skills, but should also emphasize cognitive and affective learnings that promote continuing improvement. Secondary schools are uniquely qualified to furnish that kind of instruction. They have the capability to provide qualified instructors, adequate facilities and equipment, and an atmosphere conducive to learning where large numbers of learners are found.

A Systems Approach

Motivation of students can be increased if they first see the overall picture of the operation within which their task falls. Therefore, the initial learning episode deals with the purpose, components and management forces of the highway transportation system. In addition, students consider the varying roles they will play in relating to the system, so they can anticipate and understand the purpose of subsequent learning experiences.

Tasks as Focal Points

The remainder of the curriculum is grouped around tasks performed by individuals as they participate in the highway transportation system. Three large sections are titled "On Highway Tasks," "Readiness Tasks" and "Improvement Tasks." These tasks serve as criteria for selecting objectives, content and methods. Sections are broken down into units which are divided further into learning episodes. The latter represents a homogenous body of learnings that can be taught in one to four classroom or laboratory periods. This kind of structure emphasizes the interaction of man-machine-roadway factors.

Human Functions

Human functions–identify, predict, decide and execute–involved in performing traffic related tasks, serve as reference points throughout the curriculum. These functions are identified early and referred to constantly. They act as criteria for judging the validity of both content and method. Each curriculm item is designed to improve learner capability in one or more of these functions. In short, they act as a boundary and a background for the learning experiences.

Behavioral Objectives

Instructional objectives are stated in terms of expected student outcomes and imply both content and method. They exhibit constructive changes to be produced in the behavior of students. This approach tends to motivate and direct the learning process. Objectives related to operator tasks portray real world behavior (turns, entering freeways, passing, etc.) In other cases, the behavior that can be taught and measured during the course only *enables* students to perform effectively in real world situations. In every case, however, objectives emphasize student-environment interaction as opposed to student-teacher interaction.

Fundamental Ideas (Concepts)

Emphasis is placed on ideas that *repeatedly* help operators to move from origin to destination safely and efficiently. During a driver education course students can be exposed to relatively few of the specific situations they will encounter in their driving career. Therefore, they need "tools," in the form of concepts, for coping with varying and sometimes novel conditions. For example, "separate the hazards" is a valid and practical idea that is applicable numerous times per minute of driving. Students are more likely to remember and act upon meaningful ideas than they are upon a group of fragmented facts and rules. Besides, if learning focuses on the fundamental ideas, details, if they are needed, tend to fall into place.

A Challenge to Teachers

Before Driver and Traffic Safety Education can hope to modify the behavior of young people, teachers must become more than dispensers of information and trainers of skills. Information and manipulative skills alone do not produce proficient drivers. Learning needs to have personal meaning if students are to behave differently. To facilitate meaningful learning, teaching demands competency in providing situations that encourage students to (1) examine and clarify their feelings and values, (2) explore alternative forms of behavior and related consequences, (3) make and try out decisions in new situations and (4) formulate generalizations. For best results, students need to participate actively in these higher forms of learning. In short, information and skills must be taught in such a climate that students see and accept the responsibilities associated with the learnings.

Discovery Versus Telling

Concepts that students discover are more meaningful and remembered longer than those handed down to them or imposed upon them. Quite often the process implied by the preceding statement would be too slow and inefficient. On the other hand, there are many opportunities for driver education teachers to guide students through an inquiry process that will result in student derived generalizations. Some examples of the process are presented in Section III, Unit A, "Self-Improvement." Teachers should experiment with the method in "small doses" until they build up a repertoire of questions and other techniques that are effective for them.

Efficient Use of Classroom and Laboratory Time

Scheduled classroom and laboratory time should be designed to achieve objectives that students cannot accomplish on their own initiative outside of class. Too often teachers spend class time trying to "pour in" factual information that students, properly motivated, could acquire through homework assignments. For example, most students can learn about the dynamics of vehicle control, procedures for skills and maneuvers, traffic laws, facts about alcohol and drugs, and other cognitive learning by studying well-designed textbook and lab manual material. (Poor readers and the mentally retarded will need special materials.) Some class time will be needed to determine if students have acquired the information and to clarify the more difficult parts of the assignment. But then the teacher is free to use panel discussions, role playing, demonstrations, debates, resource people, audiovisual aids, practice driving and other methods that students can experience only in the classroom or laboratory.

Planting Seeds for a Continuing Learning Process

A semester course (or less) in driver and traffic safety education will rarely change a student's "style of life" but it can change his "style of driving." Following this educational offering students should be able to identify the competencies required to operate a motor vehicle, realistically appraise their present level of competency, and instigate a course of action that will lead toward excellence. Perhaps this is the most important goal of driver education, i.e., to help students acquire the insights and motivation that will *enable* them to become the best they can become as a member of the highway transportation system.

BIBLIOGRAPHY

1. *A Study on Evaluation of Driver Education*, prepared by William A. Lybrand, principal investigator, Glenn H. Carlson, Patricia A. Cleary and Boyd H. Bauer, under contract no. FH–11–6594 for the U. S. Department of Transportation, National Highway Safety Bureau. (The American University, Washington, D.C.), July, 1968.

2. Aaron, James E. & Marland K. Strasser. *Driver and Traffic Safety Education*, (The Macmillan Company, New York), 1966.

3. *Alcohol and Highway Safety*, A report to the Congress from the Secretary of Transportation, (U.S. Department of Transportation, Washington, D.C.), August, 1968.

4. Allen, Rodney F., John V. Fleckenstein and Peter M. Lyons. *Inquiry in the Social Studies*, (National Council For The Social Studies, Washington, D. C.), 1968.

5. American Automobile Association. *Teaching Driver and Traffic Safety Education*, (McGraw-Hill Book Company, New York), 1965.

6. Anderson, William G. *In–Car Instruction: Methods and Content*, (Addison-Wesley Publishing Co., Menlo Park, Calif.), 1968.

7. Association for Supervision and Curriculum Development. *Perceiving, Behaving, Becoming*, (ASCD 1962 Yearbook Committee, Washington, D.C.).

8. Baker, J. Stannard. *Experimental Case Studies of Traffic Accidents*, Prepared as part of project by National Institutes of Health, U. S. Public Health Service (RG–5359) U.S. Bureau of the Public Roads (CPR–11–5981) (Traffic Institute, Northwestern University, Evanston, Illinois), 1968.

9. Baker, J. Stannard. *Single–Vehicle Accidents*, (Automotive Safety Foundation, Washington, D. C.), 1968.

10. Baker, J. Stannard. *Traffic Accident Investigation Manual for Police*, (The Traffic Institute, Northwestern University, Evanston, Illinois), 1963.

11. Bauer, John. "The Id and Driver Education," *Safety Education*, March, 1965, pp. 13-16.

12. Bennett, Frank. *The Development of a Workbook for Classroom Instruction in Driver Education*, (Ed. D. Thesis) New York: New York University, 1955.

13. Bishop, Richard W. *One Car Accidents and the Young Driver*, (Safety and Traffic Division, Automobile Club of Michigan), 1963.

14. Bishop, Richard W. and Gordon Sheehe. *The Role of the Community College in Developing Traffic Specialists & Technicians*, (American Association of Junior Colleges, Washington, D.C.), 1968.

15. Blackburn, J. Robert. *Concepts of Driver Education and Their Importance for a Driver Education Course in the Secondary School* (Ed.D. Thesis) Boston: Boston University, 1955.

16. Bloom, Benjamin S. *Taxonomy of Educational Objectives, Handbook I-Cognitive Domain*, (David McKay Company, Inc., New York), 1956.

17. Bloomer, Richard H. "Perceptual Defense and Vigilance and Driving Safety." *Traffic Quarterly*, October, 1962, pp. 549-558.

18. Blumenthal, Murray. *The Denver Symposium on Mass Communications Research for Safety* (National Safety Council, Chicago, Illinois), 1964.

19. Borkenstein, R. F. *A Practical Experiment on the Effects of Alcohol on Driving Skill*, (The Southern Police Institute, University of Louisville), 1956.

20. Brody, Leon. *Basic Aspects and Applications of the Psychology of Safety*, (New York University, Division of General Education and Extension Services, Center for Safety Education), 1966.

21. Brody, Leon and Herbert J. Stack. *Highway Safety and Driver Education*, (Prentice Hall, Inc., New York), 1954.

22. Bruner, Jerome S. *The Process of Education*, (Harvard University Press, Cambridge, Massachusetts), 1960.

23. Bruner, Jerome S. *Toward a Theory of Instruction*, (The Balknap Press, Cambridge, Massachusetts), 1966.

24. Cleveland, Donald E. *Manual of Traffic Engineering Studies*, (Institute of Traffic Engineers, Washington, D.C.), 1964.

25. Cragun, Merrill K., *The Fifth Stapp Automotive Crash and Field Demonstration Conference*, in cooperation with the American Association of Automotive Medicine, Conducted by the Mechanical Engineering Department of the Institute of Technology and Center for Continuation Study, (University of Minnesota), 1962.

26. Dale, Allen, *The Role of the Drinking Driver in Traffic Accidents*, (Department of Police Administration, Indiana University), August, 1964.

27. Damron, C. Frazier and Philip Lambert. *Auto-Test, for Wisconsin Driver's License Applicants*, (Dembar Educational Research Services, Inc., Madison, Wisconsin), 1969.

28. Department of Transportation. *Highway Safety Program Standards*, (U. S. Government Printing Office, Washington, D.C.), 1967.

29. Insurance Institute for Highway Safety, Washington, D.C., 1968. *Driver Behavior Cause and Effect*, Proceedings of the Second Annual Traffic Safety Research Symposium of the Automobile Insurance Industry, Washington, D.C., 1968.

30. *Driver Education and Training Project*. A final report prepared for U. S. Department of Transportation, National Highway Safety Bureau, (Institute for Education Development, El Segundo, Calif.), 1968.

31. Dunn, Leroy W. *The Development of an Instrument to Measure Knowledge of Traffic Safety Concepts Found to Differentiate Between Violators and Non-Violators* (Ph.D. Thesis), East Lansing, Michigan: Michigan State University, 1963.

32. Economos, James P. *Traffic Court Procedure and Administration*, (American Bar Association, Chicago), 1961.

33. Esbensen, Thorwald. *Working with Individualized Instruction*, (Fearon Publishers, Palo Alto, California), 1968.

34. *Evaluating the Effectiveness of Driver Education and Training*, prepared for U. S. Department of Transportation, National Highway Safety Bureau under contract no. FH-11-6560, (The Center for Safety, New York University), May, 1968.

35. *Extended Driver Education Laboratory Enrichment Project,* (Wisconsin Department of Public Instruction, Madison, Wisconsin), 1969.

36. Felsen, Henry George. *To My Son, The Teenage Driver,* (Dodd Mead & Company, New York), 1964.

37. Fine, Jerome L. and James L. Malfetti and Edward J. Shoben, Jr. *The Development of A Criterion for Driver Behavior,* (The Safety Research and Education Project, Teachers College, Columbia University, New York), 1965.

38. Florida State Department of Education. *A Guide-Driver Education In Florida Schools -(Bulletin 6),* (Tallahassee, Florida), 1963.

39. Forbes, Theodore W. "Analysis of Near Accident Reports," *Highway Research Board Bulletin pp. 23-27, 152,* 1957.

40. Forbes, Theodore W. "Traffic Engineering and Driver Behavior," *Traffic Safety Research Review,* September, 1965, pp. 87-89.

41. Fox, Bernard H. and James H. Fox. *Alcohol and Traffic Safety,* (National Institutes of Health, Bethesda, Maryland), May, 1963.

42. Fraser, Dorothy M. *Current Curriculum Studies in Academic Subjects,* (N.E.A., Washington, D.C.), June, 1962.

43. Frazier, Alexander (Ed.), *New Insights and the Curriculum,* (Association for Supervisor & Curriculum Development, Washington, D.C.), 1963.

44. Gagne, Robert M. *Psychological Principles in System Development,* (Holt, Rinehart & Winston, New York), 1966.

45. Gagne, Robert M. *The Conditions of Learning,* (Holt, Rinehart & Winston, New York), 1965.

46. Goldstein, Leon G. "Human Variables in Traffic Accidents: A Digest of Research," *Traffic Safety Research Review,* March, 1964, pp. 26-31.

47. Gordon, D. A. "Perceptual Basis of Vehicular Guidance," *Public Roads,* Vol. 34, No. 3, 1966 pp. 53-67.

48. Greenshields, Bruce D. "Investigating Highway Traffic Events in Relation to Driver Behavior," *Traffic Quarterly,* October, 1961, pp. 664-676.

49. Griffin, Garnet M. *The Teenager and Safe Driving,* (Richards Rosen Press, Inc., New York), 1968.

50. *How To Improve Driver Education in Michigan.* Final Report, A Study of Michigan's Driver Education Program, MSU Highway Traffic Safety Center, (Continuing Education Service, Michigan State University), December, 1966.

51. Huelke, Donald F. and Rollin A. Davis. *A Study of Pedestrian Fatalities in Wayne County, Michigan,* (Highway Safety Research Institute, The University of Michigan), 1969. (HSRI Report No. Bio–9).

52. Hullfish, H. Gordon and Philip G. Smith. *Reflective Thinking: The Method of Education,* (Dodd, Mead & Co., New York), 1961.

53. Isaacson, Irving. *Legal Driving,* (Legal Publications, Lewiston, Maine), 1963.

54. Jacobs, Herbert H. et al. *Behavioral Approaches to Accident Research,* (Association for the Aid of Crippled Children, New York), 1961.

55. Jones, H. V. and Heimstra, N. W. "Ability of Drivers to Make Critical Passing Judgments," *Journal of Engineering Psychology,* 1964, pp. 117-122.

56. Joyce, Bruce R. and Berj Harootunian. *The Structure of Teaching,* (Science Research Associates, Inc., Chicago), 1967.

57. Kearney, Paul W. *How To Drive Better and Avoid Accidents,* (Thomas Y. Crowell Company, New York), 1963.

58. Kelley, Earl C. *In Defense of Youth,* (Prentice-Hall Inc., Englewood Cliffs, New Jersey), 1962.

59. Krathwohl, David R., Benjamin S. Bloom and Bertram B. Masia. *Taxonomy of Educational Objectives Handbook II - Affective Domain,* (David McKay Company, Inc., New York), 1956.

60. Lipman, Michel, Ray Guenther and Bert Ballard. *Your Auto And The Law,* California Addition (Recorder Printing and Publishing Company, San Francisco), 1966.

61. McFarland, Ross A. and Ronald C. Moore. *Youth and the Automobile,* (Association for the Aid of Crippled Children, New York), 1960.

62. McFarland, Ross A., Roland C. Moore and A. Bertrand Warren. *Human Variables in Motor Vehicle Accidents, A Review of the Literature,* (Harvard School of Public Health, Boston), 1955.

63. Mager, Robert F. *Developing Attitude Toward Learning,* (Fearon Publishers, Palo Alto, California), 1968.

64. Mager, Robert F. *Preparing Objectives for Programmed Instruction,* (Fearon Publishers, San Francisco), 1962.

65. Marsh, Burton W. "Aging and Driving," *Traffic Engineering,* November, 1960, (A paper presented in response to the 1960 Theodore M. Matson Memorial Award.)

66. Marx, Barbara S., Richard Myrick and Lawrence E. Schlesinger. *A Group Discussion Program for Changing Attitudes of Younger Traffic Violators,* (Driver Behavior Research Project, The George Washington University, Washington, D.C.), 1964.

67. Morrissett, Irving. *Concepts and Structure in the New Social Science Curricula,* (Social Science Education Consortium, Inc., W. Lafayette, Indiana), 1966.

68. Moser, Robert P. "What a Superintendent Expects From Driver Education Instruction", Unpublished speech given at the 1966 Fall Workshop for Winsconsin driver education teachers.

69. Muehlberger, C. W. "Medicolegal Aspects of Alcohol Intoxication," *Michigan State Bar Journal,* February, 1956.

70. National Committee on Uniform Traffic Laws and Ordinances. *Uniform Vehicle Code and Model Traffic Ordinance,* Revised 1968, (The Michie Company, Charlottesville, Virginia), 1968.

71. National Council For The Social Studies, *Inquiry In The Social Studies,* (National Education Association, Washington, D.C.), 1967.

72. National Education Association. *Policies and Practices for Driver and Traffic Safety Education,* (The Association, Washington, D.C.), 1964.

73. Ojemann, Ralph H., Sheldon C. Friedman and Esther B. Tuttle. *Tests and Evaluation Methods Used in Driver and Safety Education,* (National Education Association, Washington, D. C.), 1959.

74. Platt, Fletcher N. *Operations Analysis of Traffic Safety,* (Traffic Safety and Highway Improvement Department, Ford Motor Company, Dearborn, Michigan), 1959.

75. Popham, W. James, et al. *Validated Instructional Materials for the Continuing Education of Teachers,* (Vimcet Associates, Los Angeles), 1966. (Filmstrips)

76. Poulton, E. C. "Psychology and Behavior of Drivers in the Causation of Accidents," *International Road Safety and Traffic Review,* Autum, 1966.

77. Prescott, Daniel A. *The Child in the Education Process,* (McGraw Book Co., Inc., New York), 1957.

78. President's Committee for Traffic Safety. *Action Program-The Master Plan to Prevent Traffic Accidents,* (Superintendent of Documents, U. S. Government Printing Office, Washington, D. C.).

79. Rashevsky, N. "Automobile Driving as Psychophysical Discrimination," *Bulletin 24-Mathematics–Biophysics,* 1962, pp. 319-325.

80. Raths, Louis E., et al. *Teaching for Thinking,* (Charles E. Merrill Books, Inc., Columbus, Ohio), 1967.

81. Raths, Louis E., et al. *Values and Teaching: Working with Values in the Classroom,* (Charles E. Merrill Books, Inc., Columbus, Ohio), 1966.

82. Richards, Hoy A. and G. Sadler Bridges. *Traffic Control and Roadway Elements - Their Relationship to Highway Safety* /Revised Chapter I *Railroad Grade Crossings* (Automotive Safety Foundation), 1968.

83. Ross, H. Lawrence. "Awareness of Collision Course in Traffic Accidents," *Traffic Safety Research Review,* March, 1961, pp. 12-16.

84. *Safety for Motor Vehicles in Use,* (A Report to Congress from the Secretary of Transportation, U. S. Department of Transportation, Washington, D. C.), June, 1968.

85. Schlesinger, Lawrence E. *Is There a Teenage Driver In Your Home?,* (Insurance Company of North America, New York), 1967.

86. Schlesinger, Lawrence E. "Objectives, Methods, and Criterion Tests in Driver Training," *Traffic Safety Research Review,* March, 1967, pp. 18-24.

87. Scriven, Michael. *Student Values as Educational Objectives,* (Publication #124 Social Science Education Consortium, Purdue University, Lafayette, Indiana), 1966.

88. Scriven, Michael. *The Methodology of Evaluation,* (Publication #110 Social Science of Education Consortium, Purdue University, Lafayette, Indiana), 1966.

89. *Secretary's Conference on Alcohol Education,* Conference Proceedings, (U. S. Department of Health, Education, and Welfare, Washington, D. C.), March, 1966.

90. *Seeing Habits for Expert Driving.* (Traffic Safety and Highway Improvement Department, Ford Motor Company, Dearborn, Michigan), 1959. (Filmstrip & Manual)

91. Selzer, Melvin L., "Automobile Accidents and The Alcoholic Personality." *Michigan State Bar Journal,* November, 1960.

92. Selzer, Melvin L., et. al. *The Prevention of Highway Injury,* (Highway Safety Research Institute, The University of Michigan), 1967.

93. Sherif, Carolyn W., Muzafer Sherif & Roger Nebergall. *Attitude and Attitude Change,* (W. B. Saunders, Co., Philadelphia, Pa.), 1968.

94. Skillman, T. S. *Road Safety - How To Reduce Road Accidents,* (David McKay Company, Inc., New York), 1966.

95. Sneller, Robert C., O. D. *Vision and Driving,* (American Optometric Association), 1962.

96. Society of Automotive Engineers. *Visual Considerations of Man, the Vehicle, and the Highway,* (The Society, New York), 1966.

97. *Special Study – Alcohol Problems and Transportation Safety: The Need for Coordinated Efforts,* (National Transportation Safety Board, Department of Transportation, Washington, D. C.), adopted: February 20, 1969.

98. Stack, Herbert J. *Safety For Greater Adventures – The Contributions of Albert Wurts Whitney,* (Center for Safety Education, Division of General Education, New York University), 1953.

99. Stratemeyer, Clara G. *Accident Research for Better Safety Teaching,* (National Education Association, Washington, D. C.), 1964.

100. *Study of the Driver Licensing Function in the State of Michigan,* MSU Highway Traffic Safety Center, (Continuing Education Service, Michigan State University), December, 1965.

101. *Summary Report – The State of the Art of Traffic Safety,* (Arthur D. Little, Inc. for the Automobile Manufacturers' Association, Inc., Detroit, Michigan), June, 1966.

102. *Teacher Preparation and Certification,* Recommendations of the National Safety Education Conference on Teacher Preparation and Certification in Driver and Traffic Safety Education, (N.E.A., Washington, D. C.), 1965.

103. Teel, Dwight, "Ethics of Driver Education Instructors.", Unpublished speech given at 1966 Fall Workshop for Wisconsin driver education teachers.

104. *Thinking About Drinking,* prepared by Children's Bureau Publication No. 456, and Public Health Service Publication No. 1683., (U. S. Government Printing Office, Washington, D. C.).

105. Unruh, Glenys G. *New Curriculum Developments,* (Association for Supervisor and Curriculum Development, Washington, D. C.), 1965.

106. Wisconsin Department of Public Instruction. *A Hit Or a Miss?* (Bulletin No. 143, Madison, Wisconsin), 1968.

107. Woodruff, Asahel D. *Basic Concepts of Teaching,* (Chandler Publishing Co., San Francisco), 1961.

Note: No attempt was made to list the multitude of high school driver education textbooks, teachers manuals, workbooks, curriculum guides, filmstrips and a variety of other materials that were quite valuable to the project staff in developing this resource curriculum.